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ORIGINAL ARTICLES.

RELATION OF INSECTS TO THE SPREAD OF DISEASE.[1]

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Until recently physicians and entomologists have been content to look upon insects as pests, whose attacks upon human beings and animals were more to be regretted than dreaded; but the evidence which has accumulated in the past few years has clearly indicated that far more than mere annoyance may result from the attacks of very minute enemies.

When one comes to consider how insects may aid the dissemination of disease, these possibilities present themselves:

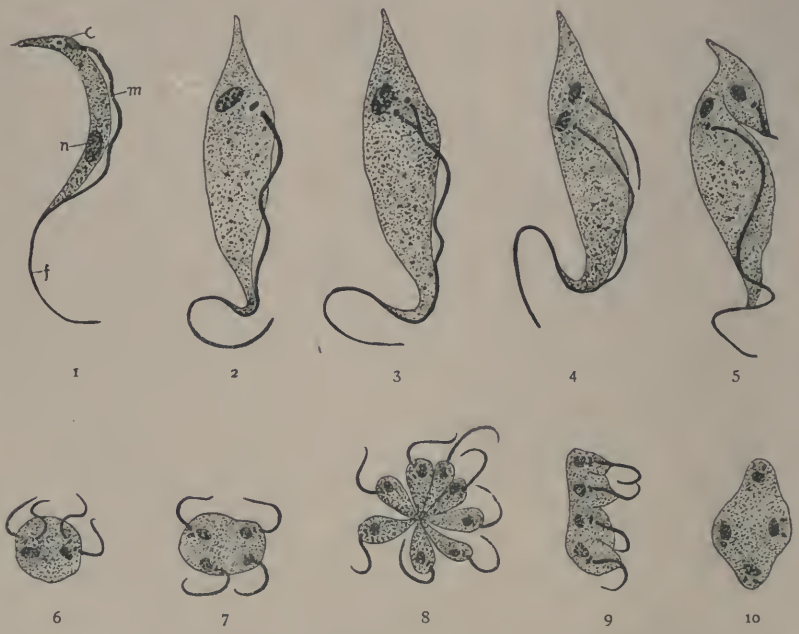
1. *Insects may carry from place to place, disease-producing microörganisms which have collected upon their bodies and limbs, and occasion infection directly by alighting upon wounds and indirectly by alighting upon foodstuffs.* An accurate demonstration of these possibilities has been made and many times repeated, and it is very likely the common house-fly that is most culpable in this direction.

2. *Insects may carry within their bodies germs of disease which have entered with the food, which may subsequently be deposited elsewhere with the feces.* This has been demonstrated in connection with tuberculosis, where tubercle bacilli, live and virulent, have been detected in the feces of flies that have been fed upon tuberculous sputum. Such infected fecal matter being deposited where it directly or indirectly infects the individual, becomes a matter of such evident importance that no further mention need be made of it.

[1] A paper read before the York County Medical Society, September, 1901.

3. *Suctorial insects, by taking blood containing parasites from the bodies of diseased animals, may carry these upon their proboscides into the next animal bitten, directly and immediately infecting it.*

The literature of medicine contains many cases in which anthrax has apparently been brought about by suctorial flies which, it has been supposed, have preyed upon diseased animals or their carcasses and subsequently bitten men. It has also been repeatedly stated that plague may be propagated by such direct infection from the bites of fleas, and it has even been stated that the fleas of the lower animals, by biting human beings, may carry infection to them. This has not yet been demonstrated, however, and while it is true that when fleas and other parasites are permitted to suck blood containing the plague bacillus, the microörganisms can subsequently be removed from their bodies, Nuttall was unable to show that the microörganisms are transmitted by the bite of the insect. In plague and similar diseases, the possibility of course remains that fleas and other biting insects which take up blood containing infectious microörganisms may subsequently deposit them, in their feces,



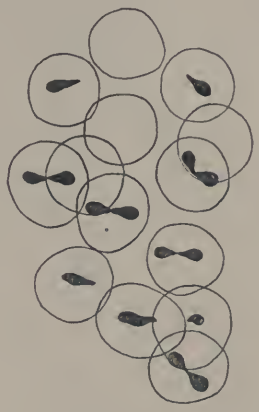
I.—Trypanosoma, complete cycle of development, showing division: *n*, the nucleus; *c*, centrosome; *m*, undulating membrane; *f*, flagellum. 5 shows a small trypanosome separating from the parent organism; 6–9 show sporulation of the organism. (From Laveran.)

upon the skin, so that subsequent indirect infection may take place. In certain parasitic diseases, however, it has been clearly demonstrated that the bites of insects are accompanied by direct infection. Rabinowitsch and Kempner have shown that trypanosoma infection of rats is transmitted by flea-bites, from infected to healthy animals (I). The tsetse fly disease, which in Zululand and other parts of Africa causes the loss of all domestic animals—horses, cows, dogs, sheep, etc.—is also caused by the transmission of trypanosomes by fly-bites. The tsetse fly disease was noticed by the earlier African explorers, who found that so soon as a certain district which it inhabited was reached, their cattle were attacked by large flies whose appearance resembled the honey-bee, both in size and color (II). The bites of these insects were quite painful, but except for

II.—The African tsetse fly (*Glossina morsitans*). From Lydskker's New Natural History.

the temporary inconvenience were harmless to man, though domestic animals, shortly after being bitten, fell into a febrile cachexia, and died after a few weeks' suffering with weakness and emaciation. The actual demonstration that the bite of the fly was the cause of the disease was readily made, and it has since been clearly determined, first, that the flies become infected through the blood of wild animals in certain districts, and secondly, that they impart the infection to imported domestic animals by their bites. The wild animals

from whom the flies derive the parasites probably possess enough natural inherited immunity to protect them from fatal infection. The infected flies are capable of imparting the disease for a limited time only, and cease to be harmful a few days after infection. Bruce found that the tsetse fly disease depends upon a minute animal parasite belonging to the Trypanosoma, which it transfers from animal to animal by its bite. Exactly the same result may be obtained by experimentally injecting the animal with blood containing trypanosomes. The short time during which the parasites remain in the fly removes the likelihood that they undergo any metamorphosis in its body. Additional evidence that no metamorphosis is recorded is found in the fact that live parasites (trypanosomes) are no longer found in the fly's stomach after 140 hours, and that with their disappearance from the stomach the danger of infection from the fly-bite ceases. In favor of the parasite undergoing some metamorphosis is the fact that it is only the tsetse fly that is capable of transmitting the disease, although in the regions in which the tsetse fly disease occurs many other suctorial flies are found.



III.—*Pyrosoma bigeminum* (Smith), the parasite of Texas fever, in the blood-corpuscles of a cow suffering from the disease.

4. *Insects may take infectious germs into their bodies and transmit them to their offspring, whose bites are infectious.* The disease in which this is best seen is the Texas fever of cattle. It is caused by a minute parasite which Theobald Smith has called *Pyrosoma bigeminum* (III). This parasite, together with blood, is taken into the body of the "Texas fever tick," the particular tick instrumental in the spread of the disease being called *Boöphilus bovis*. After one of

these ticks has gorged itself with the infected blood, it drops to the ground, deposits its eggs, and subsequently dies. In a short time the eggs hatch out, and the little ticks, as soon as opportunity affords, attach themselves to cattle, transmitting to them the infectious organism inherited from the parent tick, and causing Texas fever (IV). This discovery was made by Smith and Kilborne, and

1 2

IV.—The Texas fever cattle tick (*Boöphilus bovis*): 1, male; 2, female. Enlarged about two diameters. Redrawn from the Reports of the Bureau of Animal Industry.

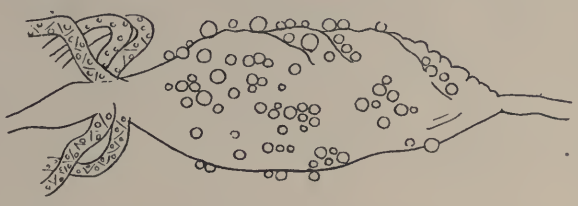
further demonstrated by Koch, who hatched out two broods of ticks, one from the eggs of an infected tick, the other from the eggs of an uninfected tick. The young ticks of these two groups, being kept separately, were taken to a part of the country in which accidental infection is impossible, and where the ticks were permitted to attach themselves to non-immune cattle. It was found that the offspring of uninfected ticks was harmless, while the offspring of the infected tick produced Texas fever. In what form the transmission from parent tick to egg and offspring occurs has not been demonstrated, as the young ticks are so small as to make investigation of this point attended with many difficulties.

5. *Insects may take into their bodies parasitic organisms which there undergo a further development, the insect acting either as an intermediate or a definitive host, and transmitting the parasites to other animals in some changed form in which they are infective.* In this sphere also our knowledge is meager, but it is to be hoped that the investigations which are at present in progress on every hand will lead to further brilliant discoveries.

We are now familiar with a group of affections whose parasitic organisms have a double life-history, the specific organism spending

part of its existence in warm-blooded animals, and part of its existence in an insect. As illustrating this form of parasitic disease, the malarial infections of mammals and birds stand preëminent. The malarial parasite as it appears in human blood was first discovered by Laveran in 1880. He observed its development, watched its division, noted its various forms, and described the flagellated body. Golgi and others systematized the life-history of the parasite as it is seen in human blood, but for years the source of the parasite was not determined, and it was supposed that its entrance into the human body was accomplished by inhalation or ingestion. Manson, of Liverpool, never could accept these opinions, but believed that the life-history of the malarial microörganism was completed in the body of a mosquito or some other suctorial insect. Manson's idea was that when the mosquito took into its body some blood containing malarial parasites, the adult parasite underwent, in the body of the mosquito, identical changes with those he had observed in drawn blood under the microscope, flagellated bodies being formed and the flagella detaching from the parasite and swimming away. He believed that these flagella were forms of the parasite destined to undergo future development in the insect, and that they bored through its intestines, and took up their residence in some part of its body. The mosquito subsequently returning to pools of water for the purpose of depositing its eggs, and terminating its existence about these pools, undergoes dissolution in the water, liberating the contained parasites in a form free to infect any human being drinking the water. This theory seemed sufficiently plausible for a time, but the work of Ross, which is one of the most brilliant of modern times, has entirely disproved it. Having worked with Manson in England and becoming enthusiastic over his mosquito theory of malaria, Ross began his work at Secunderabad in India. Ross permitted mosquitoes to suck the blood of patients rich in malarial parasites, and then sought for the parasites in the stomach and intestines of the insects, where he found them readily enough, and observed the formation of flagellated bodies. Notwithstanding the large number of mosquitoes which he examined, he was, however, unable to trace the parasite in the body of the mosquito or observe any metamorphosis there. During all of this period his experiments were made with ordinary mosquitoes, of the genus Culex. Instead of despairing at not finding the parasites undergoing any cycle of development in the mosquitoes, Ross concluded that the difficulty might be that he was not experimenting with the proper mosquitoes, and therefore tried mosquitoes of different

genera, and was at last delighted to find that in a certain "dapple-winged" mosquito of the genus Anopheles, about thirty-six hours after the ingestion of infected blood, a pigmented body or "zygote" appeared upon the outer surface of the mid-intestine (V). Having now determined that a certain mosquito could act as a host to the



V.—Mid-intestine of a mosquito, showing a large number of the zygotes of the malarial parasites appearing like buds upon the outer surface. (Manson.)

parasite, it became very much less difficult to follow the metamorphosis of the parasite in its body, by a series of careful observations. Ross continued his experiments at Calcutta, but owing to the agitated state in which he found the people, who were terrified at the ravages of the plague in that city, he was obliged to use the malarial affection of birds caused by the Proteosoma Grassii (Labbé) for the investigation (VI). He was able to show that thirty-six

VI.—Avian cycle of the Proteosoma Grassii (Labbé) (from Opie): 1–7, intracorpuscular parasites; 8-9, segmenting parasites; 10, gametocytes.

hours after malarial blood is consumed by a mosquito the zygote or fertilized parasite penetrates the intestinal wall and appears upon its external surface, where it continues to grow for some time. Having attained a very large size, the cytoplasm breaks up into a number of segments or "meres." Still later each mere undergoes cleavage with the formation of a large number of crescentic or vermicular spores or "blasts" (VII). The formation of blasts is followed by their

VII.—Mosquito cycle of the development of the malarial parasite: 1, 2, and 3 show the zygote or fertilized parasite as it appears on the outer wall of the mid-intestine of the mosquito; 4–5 show the stage of meres and the formation of blasts; 6 shows rupture of the cell-wall and escape of the blasts; 7, free blasts such as escape with the saliva of the mosquito into the wound made by its proboscis. (From Manson.)

migration to all parts of the mosquito, many of them reaching the salivary glands, from which they finally pass into the proboscis to escape with the salivary secretion the next time the insect bites. In this way the mosquito determines the spread of malarial infection by the introduction of embryo parasites with its bite.

While Ross was engaged upon these discoveries in India, considerable valuable work was being done in Italy, also tending to prove the part played by mosquitoes in malarial infection. The Italians, however, devoted themselves less to the life-history of the malarial organism in the mosquito than to the geographical distribution of mosquitoes. Having accurately defined the geographical distribution of malaria in Italy, they next set about determining the geographical distribution of mosquitoes, and found that in all malarial districts two mosquitoes were invariably present: one of these the Culex, of

almost universal distribution; the other, belonging to the genus Anopheles, found only in malarial districts. At the same time that Ross discovered that Anopheles could act as hosts for the malarial parasites, the Italians had determined that the Anopheles were peculiar to all malarial districts. The discoveries of Ross have been subjected to abundant confirmation by Koch and his associates of the German East African expedition, and by Bignami, Grassi, Marchiafava, and others in Italy, by Thayer, Waldert and others of this country; and the amount of experimental work carried on has made our knowledge of malaria more complete than that of any other microparasitic disease. At the present time the following true malarial parasites are recognized:

The parasite of tertian fever.

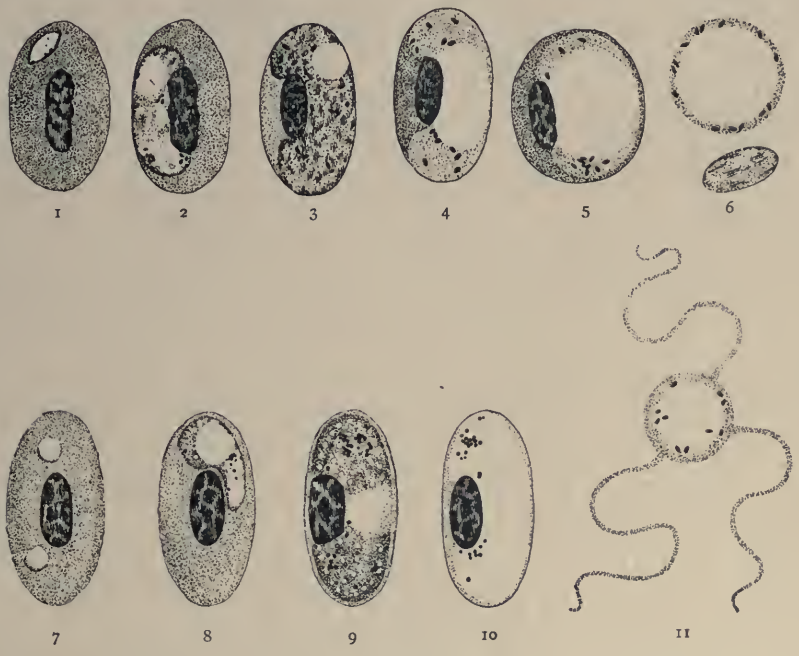
The parasite of quartan fever.

The parasite of estivo-autumnal fever.

The malarial parasite of monkeys, discovered by Kossel.

The Proteosoma Grassii of sparrows and canary-birds.

The Halteridium Danilewski of crows, buzzards, and large birds (VIII).



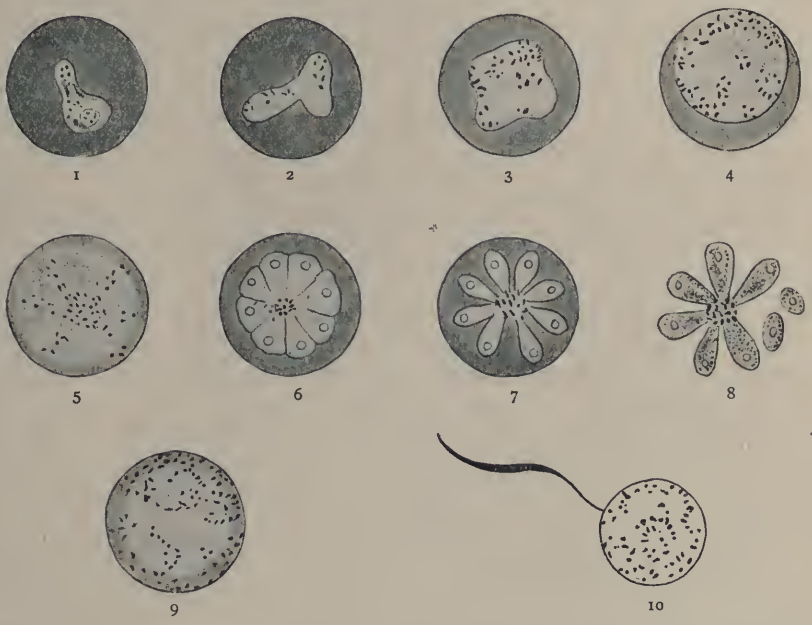
VIII.—Avian cycle of the Halteridium Danelewskyi (Labbé) (from Opie): 1-6, intracorpuscular growth of the parasite; 6 and 11, gametocytes; 7-10, peculiar forms of the parasite.

The life-history of the human parasites was first made clear to us by the study of the related organisms in birds, all the knowledge thus obtained having been subjected to abundant subsequent demonstration upon the human parasites.

IX.—Human cycle of the parasite of tertian malarial fever: 1–7, growing intracorpuscular parasites; 8, segmenting parasite; 9–10, gametocytes.

The life-history of the human malarial parasite can be divided into two cycles, one of which occurs in the human being, the other in the mosquito (IX). The first cycle consists of the appearance of intracorpuscular parasites which increase in size until a little larger than the erythrocytes, then segment with the production of spores which infect new corpuscles, develop into adult organisms, segment again, produce more spores, infect new corpuscles, and so on, the number of organisms present in the blood constantly increasing. Secondly, the cycle in the mosquito discovered by Ross, in which the adult parasite contained in blood ingested by the mosquito, being fertilized in its intestine, penetrates its intestinal wall, appearing as a zygote on the exterior, subsequently dividing into meres and blasts, reach-

ing the salivary glands, and ultimately infecting any other human being through the saliva of the mosquito as it bites. These two cycles are entirely dissimilar, and have nothing to do with one another. A human being affected with malaria is incapable of infecting another, because of the inability to transmit the parasites contained in his blood. Malaria is not, therefore, a contagious disease. Should the blood of a malarial patient with its contained parasites be experimentally injected into another, immediate infection would result from the continuance of the human cycle of parasitic development (X). This, however, is impossible under natural



X.—Human cycle of the parasite of quartan malarial fever: 1–5, growing intracorpuscular parasite; 6–9, segmenting parasites; 9–10, gametocytes.

conditions, as there are no means by which the parasites can escape from the blood of the infected individual. It is here, therefore, that the necessity for an intermediate host becomes evident. The probability of immediate transfer from one patient to another by a suctorial insect is, however, unlikely, as once having bitten the mosquito is satisfied. Therefore the necessity for a prolonged residence in the mosquito's body and the development of some form easy to transmit. The normal Anopheles mosquito is harmless, and by its bite is no more dangerous than any other mosquito; but when it preys upon

blood containing malarial parasites it becomes infected, becomes the host of a parasite which undergoes a complex metamorphosis in its body, and imparts to it the power of distributing the disease. It is, therefore, evident that the Anopheles mosquito is the definitive host of the parasite, but that it is not the mosquito but the parasite contained within the mosquito which causes the disease. It is not "being bitten by mosquitoes" that causes malarial fever, but being "infected by mosquitoes" that is responsible for it. At first it might seem as if this method of distributing the disease were so simple that every one might become infected; in reality, however, the obstacles to its spread are so numerous that it is really remarkable that so many cases of malarial infection do occur.

The only conditions permitting the occurrence are: (1) The primary existence or importation of malaria in a district; (2) the presence of the necessary genus of mosquitoes; (3) the infection of mosquitoes by the blood of a patient; (4) the lapse of the necessary time, during which the parasites mature in the mosquito; (5) the transmission of the parasite when the infected mosquito shall bite.

Taking into consideration the fact that the Anopheles is a nocturnal insect, that the females only suck human blood, that it is possible that the female insect sucks human blood only after fecundation, that it requires at least a week for the perfection of the parasitic cycle in the mosquito, that when mosquitoes are kept in confinement not many of them survive more than a few days, and that it is necessary for these mosquitoes to bite in order to infect a human being, it becomes apparent that there are many obstacles standing in the way of the ready dissemination of the disease.

A second important affection in which the mosquito appears to play the part of a definitive host is *yellow fever* (XI). The microparasite of this disease has not yet been discovered, but the analogy between it and malaria is so great that there seems to be little doubt about its being caused by protozoan parasites distributed by the mosquito. According to the researches of Reed and Carroll, a mosquito called *Stegomyia fasciata* is the specific host. The Stegomyia is chiefly nocturnal in habit. Only fecundated females suck human blood. The bites of uninfected Stegomyia are as harmless as those of other mosquitoes. If, however, the Stegomyia suck the blood of a yellow fever patient, it becomes infected and subsequently capable of disseminating the disease. At first sight it might appear as if the transfer of infectious material was direct, like the transfer of trypanosomes by the tsetse fly. This is, however, not the case, as an interval of about ten days must intervene between the infection of

the mosquito and the infectiousness of its bite. Contrary to all previously accepted theories, Reed and Carroll have thoroughly demonstrated the inability of fomites to propagate yellow fever, and have in consequence greatly simplified the prophylaxis of the disease. The protection of yellow fever patients from mosquitoes by proper window screens and bed canopies, the use of sulphurous oxide gas and

XI.—Mosquitoes known to act as definite hosts of parasites: 1, *Culex pipiens*, the host of the filaria sanguinis hominis; 2, *Anopheles quadrimaculata*, the host of the hæmatophyllum malariæ; 3, *Stegomyia fasciata*, the host of the yellow fever parasite.

pyrethrum powder to kill mosquitoes in houses and rooms occupied by yellow fever patients, and the defense of the well from infected mosquitoes by screens and bed canopies, has been proven a perfect safeguard against the spread of yellow fever in Havana. No other mosquito than the *Stegomyia fasciata* seems able to act as a host for

the yellow fever parasite. Careful examination of the climatic, telluric, and geographic distribution of yellow fever coincides perfectly with the distribution of stegomeia.

A third disease in the transmission of which insects are concerned is *filariasis*. The nocturnal occurrence of the embryo stage of the filaria in the human blood suggested to Manson and others that some nocturnal suctorial insect might be instrumental in the spread of the disease by acting as a host for the parasite. The nocturnal insect which suggested itself as the most widely distributed and eminently fitted for the purpose was the mosquito. The investigation of the changes taking place in the filarial blood ingested by the mosquito has shown that the embryo worms, three or four hours after meeting the digestive juices of the insect, escape from the surrounding hyaline sheaths so characteristic of them in the human blood, penetrate the intestine of the insect, enter its body cavity, and encyst themselves in the thoracic muscles. After a residence of somewhat variable duration, usually sixteen to twenty days, in the body of the mosquito, the little worms make their way toward the head and ultimately into the root of the proboscis (XII.) It is supposed

XII.—Section of the head of *Culex pipiens*, showing embryo filaria at the root of the proboscis (modified from Manson). *a*, embryo worms.

by Low that the little worm remains encysted in the proboscis of the insect until its entrance into the tissues of some warm-blooded animal stimulates it to activity, causing it to leave its encysted position and enter the wound. In this way the filarial infection is conveyed from individual to individual by the mosquito. It is interesting to observe in passing that Low observed that the worms usually took up their encysted position in the head and proboscis of the mosqui-

toes in pairs, as if to make sure that embryo worms of both sexes should enter when the insect bites. A careful investigation of different mosquitoes reveals the same fact that has been so clearly demonstrated in connection with malaria and yellow fever—that is, that only certain mosquitoes are by nature qualified to act as hosts for the parasite. The mosquitoes with which this disease is identical are *Culex pipiens* and *Culex ciliaris*.

6. *The insects may become infected with pathogenic organisms, die, fall into foodstuffs, and thus impart infection to man.*

The possibility of this must be apparent to all who have been unfortunate enough to find occasional flies and roaches in restaurant provisions, but the probability of it being an important source of infection is not great, as such accidents are rare. When we remember, however, that Yersin and Nuttall have found that flies become infected with plague and die of the disease, the danger that might lurk in such an insect cadaver need not be magnified.

PURULENT OPHTHALMIA OF THE NEW-BORN.[1]

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My apology for presenting a paper on a subject that has been so frequently discussed in medical societies and in medical literature is the practical importance of a thorough understanding of the disease by the general practitioner. While not attempting to introduce any new points concerning infantile purulent ophthalmia, I desire to record a few thoughts that have been found important in a rather extensive experience in the management of this class of cases.

First of all, I desire to align myself with the advocates of Credé's method of prophylaxis. The use of a two-per-cent solution of nitrate of silver dropped upon the eye of the newly-born infant is a procedure that has prevented the occurrence of the disease in thousands of instances. While it is a routine measure in most lying-in institutions, the method is not generally employed in private practice. There can be little objection urged against its use, and much can be said in its favor. The technique of instillation is of considerable importance. The infant should be securely held to prevent possible injury to the eye, the lids gently drawn back, and the remedy applied by means of a dropper, the solution being let fall not directly upon the cornea, but at one side. These simple directions being carefully carried out, little subsequent irritation will be noted.

Regarding the bacteriology of ophthalmia neonatorum there is one point of importance, and that is, that the disease is not necessarily one of gonorrheal origin. While the gonococcus plays an important part in its causation, it must be remembered that one or more of the other pathogenic organisms may be the infecting agent. I have had under my care during the past six weeks two cases of severe ophthalmia neonatorum, one presenting considerable destruction of the cornea, in which repeated examinations failed to disclose the presence of the gonococcus.

The essentials in the successful management of purulent ophthalmia cases occurring in the new-born are: (1) Early diagnosis; (2) skilful technique in the eversion of the lids; (3) prompt and thorough application of medicaments to cleanse the eye, and neutralize the action of pathogenic organisms; (4) intelligent and consci-

[1] Read before the Illinois State Medical Society, May, 1901.

entious nursing; and (5) attention to the physical condition of the patient.

With the clinical picture of ophthalmia neonatorum so typical, and the indications for prompt treatment so obligatory, it is astonishing how, in many instances, precious time is lost in applying inefficient and dilatory treatment, the disease in the meantime making destructive inroads, from which the eye may never recover.

A certain amount of skill is required in the eversion of the lids, as more or less edema is always present. It is absolutely necessary that a good view of the cornea be had, and in the application of medicaments the conjunctival surface of the lids should be well exposed in order that all parts of the diseased membrane may be touched. This point I consider of great importance in the treatment of the ophthalmia neonatorum. I have repeatedly observed cases treated with the same remedies improve at once when the conjunctiva up to and including the retrotarsal folds was included in the applications. The lids must be gently everted or the cornea will be damaged, or in case it is already ulcerated rupture may occur. This unfortunate accident not infrequently follows a violent attempt to forcibly evert the upper lid. If the lid retractor be used, the same caution applies.

For the purpose of cleansing the eye the most important feature of the treatment is an irrigator. The vessel should hold at least two quarts, and should be placed not more than one foot above the patient's head. The irrigator in its entirety should be frequently cleansed, particular attention being paid to the nozzle. A strip of antiseptic gauze wrapped about the latter and renewed occasionally will be of assistance in accomplishing this end, and besides, will possibly lessen the danger of injury to the cornea, in case of carelessness on the part of the nurse.

The eyes should be freely irrigated both day and night at intervals sufficiently frequent to keep the parts free of the rapidly forming pus. I have had patients whose eyes have been flushed at intervals of fifteen minutes for many hours. The nurses are invariably instructed to keep the eyes free of discharge, and the importance of the procedure explained to them. Sleep on the part of the patient should not influence the attendant in performing this duty. After the infant has been under treatment for a short time the irrigation can generally be done thoroughly without awakening.

Nursing in ophthalmia neonatorum is of great importance, and upon the intelligence and faithfulness of the attendants to a great extent depends the success or failure of the treatment. On beginning

the treatment of a case of purulent ophthalmia, provision should immediately be made for the employment of two intelligent persons, preferably women, one of whom should be in constant attendance upon the patient, both day and night. The mother as a rule is physically unfit, on account of the lowered vitality incident to the parturient period, to render much aid in the care of the patient. It is the imperative duty of the physician to see that the nurses selected are intelligent, and trained to a greater or less extent in the care of infants. He should not only instruct them verbally regarding the mechanical cleansing of the eyes, but should practically demonstrate the maneuver. Frequent supervision is absolutely necessary. This point, I contend, is of the greatest importance. It has been my observation that nurses, well trained in other departments of surgery, are weak in the care of eye patients, generally from fear of doing injury to delicate organs.

A factor often ignored in the management of cases of purulent conjunctivitis of the new-born, and one of considerable significance, is that relating to the physical condition of the patient. My attention has more than once been called to this fact. Poor nutrition is always a damaging agent in the prognosis of this disease, the cornea being liable to bacterial invasion and dissolution. Prematurely born children, or those of a weakly constitution, or those artificially fed, deserve particular attention and care.

As to the local remedies employed in ophthalmia neonatorum, and which by the way are not so important, in my opinion, as the manner in which they are used, they are exceedingly simple. The solution of boric acid, three-per-cent, is perhaps as efficacious as any that can be used for irrigation. Concerning applications, I have yet to see the claimed superiority of any of the newer preparations over the nitrate of silver. I am accustomed to apply the silver, in the average case presenting a free purulent discharge, of the strength of two per cent, and daily increase the strength until the symptoms ameliorate. It is not unusual to employ solutions as strong as 10 and 12 per cent in severe cases. In the first few days of the attack, when the discharge consists of a thin straw-colored serum, such applications are harmful. It is at this stage of the disease that the lids are usually swollen—possibly to such an extent as to prevent free eversion. It is in such a case that canthotomy, freely done, will be of great benefit in relieving pressure, and allow free exposure of the retrotarsal folds, so necessary in making applications. Canthotomy is not a difficult operation, and it is generally followed by marked benefit.

The employment of cold compresses is oftentimes of decided value in the treatment of purulent conjunctivitis. By reducing the temperature of the conjunctiva the condition is rendered less favorable for the growth of microörganisms. Pledgets of cotton, or small pieces of sterile gauze, moistened and laid on a cake of ice, may be applied for several hours at a time. They should be changed every minute or two, and after three or four hours' continuous application may be discontinued for an hour, and then employed again. When swelling of the lids subsides, or corneal haziness or ulceration supervenes, it is well to omit the compresses. The eyes should be carefully examined on the first and on each succeeding day for corneal ulceration. If such occurs, atropine in iodoform ointment may be employed. Corneal involvement in this disease always makes the prognosis grave.

It is not obligatory that the patient with purulent conjunctivitis be confined to a darkened room, as is still the custom in the management of acute ocular disorders in some localities, but should be taken occasionally into the open air and even into the sunshine, the eyes being shaded by means of a dark veil. The infant should receive baths at regular intervals followed by friction, and should be placed under a regular dietary and hygienic regimen.

There will occasionally be met a case of ophthalmia neonatorum that does not do well even when the diagnosis has been made early and intelligent treatment instituted promptly, but the great majority of cases conscientiously treated from the beginning have a favorable outcome.

100 STATE STREET.

A STUDY OF THE HEREDITARY EFFECTS OF ALCOHOL.

BY J. M. FRENCH, M.D., MILFORD, MASS.

Important as are the consequences of the habitual use of alcoholic drinks in the individual, whether we consider the immediate and temporary effects of intoxication, paralysis and anesthesia, or the more remote and lasting ones of structural disease, tissue-degeneration and shortened life, these all sink into insignificance when compared with those far-reaching results which are transmitted by the individual drinker to his posterity through the operation of the laws of heredity.

The general principle involved is thus stated by Elam, in his essay on Natural Heritage: "An acquired or habitual vice will rarely fail to leave its trace upon one or more of the offspring, either in the original form or one closely allied." And again he states the special law which governs in this particular case: "The offspring of a confirmed drunkard will inherit either the original vice or some one of its countless protean transformations." It is hardly possible to state the case more clearly.

The hereditary effects of alcoholism are multiform, and include among the most important ones the following: Inherited inebriety, imperfect development, constitutional debility, shortened life-term, the various neuroses, epilepsy, tuberculosis, insanity, pauperism, and crime.

Legrain thus describes the reciprocal relations between alcoholism and cerebral inferiority: "(1) Cerebral inferiority, the direct cause of excess in drink, has its origin most frequently in heredity; that is, excessive drinkers are degenerates. (2) Alcohol is one of the most powerful causes of mental degeneration; that is, the sons of inebriates are degenerates. The relations between alcohol and mental degeneration are comprised within this terribly vicious circle, which is irrefutably traced out and confirmed by innumerable eloquent medical observations."

Darwin says: "It is remarkable that the diseases from drinking spirituous or fermented liquors are liable to become hereditary even to the third generation, gradually increasing, if the cause is continued, until the family becomes extinct."

The fact of the transmission of inebriety is admitted by all observers, who only differ as to its comparative frequency. Dr. Bare believes that 25 per cent of all cases of inebriety are hereditary. Dodge estimates the proportion at 50 per cent; Norman Kerr at over

50 per cent; Mason at 60 per cent; Day at 70 per cent; Magnan, Parrish, and Crothers at 80 per cent.

Heredity in inebriety is of three varieties: First, it may be direct, as in those cases in which the craving for and special susceptibility to alcohol are transmitted from one generation to another, the form remaining substantially the same. Not all the children of drinking parents will in every case be affected, and it is said that the line of inheritance is apt to be from mother to son, and from father to daughter. Sometimes one generation will be omitted, and the disease will reappear in the next. For example, if the daughter of a drunken father should be subject to such an environment that her tendencies to inebriety are not developed, her sons will yet in a large proportion of cases fall into drinking habits and develop inebriety. Those of the sons who escape will do so almost invariably by avoiding alcohol entirely. They cannot be moderate drinkers.

Secondly, it may be indirect, as in those cases where inebriety in the parent or some more remote ancestor has resulted in debilitated constitutions, and a variety of degenerated conditions, such as epilepsy, mental inferiority, nervous instability, consumption, and various nerve defects in the offspring. This may run along through two or three generations, and then—with the first appearance of the exciting cause, or even without it—suddenly break out into inebriety. These persons are weak, mentally and physically, short-lived, and are with difficulty restored.

Thirdly, the heredity may be complex, as in those instances where various forms of degeneracy, disease, and mental and nervous imperfections—as epilepsy, hysteria, chorea, and minor forms of insanity—exist in several generations, and finally result in inebriety in a succeeding generation. In all these cases inebriety develops very readily.

There is also a physical inheritance and a mental and moral one. Thus, in the children of inebriates, especially if the inebriety is of more than one generation's duration, there will usually be found physical defects and deformities, such as clubfoot, harelip, cleft palate, and other signs of imperfect development; or there may be extreme grossness of organization or frailty of structure, abnormally shaped heads, ears, feet, congenital defects of vision, etc.

In mental and moral heredity we find mental instability and feebleness, eccentricity, excitability, boundless faith and hope or absurd despondency and despair, moral insanity, pauperism, prostitution, crime.

Morel gives a history of the development of hereditary inebriety from his own observation, thus:

"First generation—immorality, depravity, alcoholic excess, and great moral degradation in great-grandfather, who was killed in a tavern brawl.

"Second generation—hereditary drunkenness, maniacal attacks, ending in general paralysis, in grandfather.

"Third generation—sobriety, delusions of persecution, and homicidal tendencies, in father.

"Fourth generation—defective intelligence, mania at sixteen; transition to idiocy; generative functions feeble; sisters imbecile; wife had a bastard child of good constitution."

Turner relates, in his History of the First Inebriate Asylum in the World, the following: "Among the responses received from physicians was one from H. H. Childs, of Pittsfield, Mass., in which he gave a brief history of a family for three generations, all of whom had died of constitutional or hereditary inebriety. The father, a hard and continuous drinker for thirty years, died at the age of 61, with delirium tremens. His son, a periodical drinker, having his sprees once in two months, died of convulsions at the age of 41. Of the four grandchildren, three sons were periodical drinkers, and all three died under 30 years of age. The granddaughter was the victim of insanity, and died in an insane asylum at the age of 24."

Professor Pellman, of Bonn University, Germany, traced the careers of the descendants of Frau Ada Jurke, who was born in 1740, and was a drunkard, a thief, and a tramp for the last forty years of her life, which ended in 1800. Her descendants numbered 834, of whom 709 were traced in local records from youth to death: 106 of the 709 were born out of wedlock; there were 144 beggars, and 62 more who lived from charity. Of the women, 181 led disreputable lives. There were in the family 76 convicts, seven of whom were sentenced for murder. In a period of some seventy-five years this one family rolled up a bill of costs in almshouses, prisons, and correctional institutions amounting to at least 5,000,000 marks.

Anthony relates the case of a healthy woman who was married at the age of 17 to a notorious drunkard, and who had by him in her nine years of married life five miserable little children, of whom four died within the first ten days after birth. The fifth one, by great care, was raised to the fourth year, when it also died. After this the woman was separated from her husband. She then married a healthy man, and had by him two children, the elder of whom grew to be four years old, and the younger at the time of writing was

fourteen days old. Both were in perfect health. Inasmuch as syphilis was not a factor in this case, it is evident that the alcoholism of the father of the first children destroyed their vitality.

Professor Demms, of Stuttgart, Germany, gives the following record of the result of his observations of ten families of drinkers and ten temperate families for a period of twelve years.

The ten drinking families produced in those twelve years fifty-seven children. Of these twenty-five died in the first week of life, of weakness, of convulsive attacks, or of edema of the brain and its membranes. Six of the children were idiots; five were stunted in size, and were of dwarfish growth; five, when older, became epileptics; one, a boy, had grave chorea, ending in idiocy; five had inherited diseases and deformities, such as chorea, hydrocephalus, harelip, and clubfoot. Two of the epileptics mentioned became, by inheritance, drinkers. Only ten of all these fifty-seven, or 17.5 per cent, showed during youth normal disposition and development of body and mind.

The ten temperate families produced in twelve years sixty-one children. Of these, five died in early infancy of weakness; four in later years of childhood had curable nervous affections; two only showed inherited nervous defects. The remaining fifty, or fully 81 per cent, were normal in every way, developing well in body and mind.

There is a class of men who claim that they have been moderate drinkers for a long period of years, and yet have never been drunk, have had uniformly good health, and have lived to a good old age—in short, that they have been uninjured by their regular use of alcohol. And it must be confessed that, so far as appearances go, there is some ground for their claim. But if we follow the case to the next generation, the fallacy of the claim becomes evident. This fact is well illustrated by an item in the *Journal of Inebriety:* "I have drank whiskey every day for thirty-three years," remarked a gentleman of 60 rather proudly, "and I don't see but I have as good a constitution as the average man of my age. I never was drunk in my life." He was telling the truth, but to learn the whole truth we will have to study his children. The oldest, a young lady, had perfect health. The second, a young man, was of a remarkably nervous and excitable temperament, as different as possible from his phlegmatic father. The third, a young lady of 17, was epileptic, and always had poor health. Did the father's whiskey drinking have anything to do with these facts? This case may be duplicated in almost every community.

The superintendent of a hospital for children in Berne, Switzerland, has found by careful observation that only 45 per cent of those whose parents use alcohol habitually had good constitutions; while 82 per cent of the children of temperate parents had sound bodies. Of the children of inebriates, only six per cent were healthy.

"In fifteen years' constant study of these cases," says T. D. Crothers, "I have never seen a family of moderate drinkers that was followed by robust, healthy children. I have seen some very bright children from such parentage, but in every instance they died out early, from some degeneration which a more vigorous race would have overcome. I believe no fact can be substantiated by more conclusive evidence than this. The children of moderate or excessive users of spirits are always weakly, and of more unstable brain and nervous system; more liable to be inebriates, to suffer from nervous diseases, to be insane, to die of consumption, to be defective in every way, and to die early."

The statistics of alcoholic heredity gathered by Legrain of Paris are especially interesting. Out of 814 children of alcoholics observed by him, 322, or 40 per cent, were degenerates. Seventeen per cent of these were epileptic or hysterical. By adding 174 who had not strength to survive, but died of infantile weakness and debility, the percentage runs up to 61. Four per cent showed distinct moral impurity. The number of children who became alcoholic is not given.

Thus we see that alcohol is the greatest cause of degeneracy, both mental and physical.

When not an inebriate, the subject is likely to be diseased, degenerate, mentally unstable or unbalanced, fanatical, eccentric, or a genius.

Inherited inebriety develops rapidly, at the first exciting cause. The subject cannot be a moderate drinker. He is either a total abstainer or a drunkard.

Inherited inebriety is difficult to cure, and when apparently cured the subject is extremely liable to relapse.

THE HISTOPATHOLOGY OF THE PANCREAS IN DIABETES MELLITUS.[1]

BY MAXIMILIAN HERZOG, M.D., CHICAGO, ILL.,
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After v. Mering and Minkowski had shown conclusively that complete extirpation of the pancreas, in certain animals in which this operation can be performed, is invariably followed by diabetes mellitus, it became clear that this organ has a specific function with reference to carbohydrate metabolism, a function which cannot be taken up vicariously by any other organ of the body.

The demonstration of this fact led to a search for specific changes in the pancreas in diabetes. Such morbid changes as were described lacked specificity, however, because they were either likewise found in diseases of the pancreas, not associated with diabetes, or they were of a general character, such as arteriosclerosis, and manifestly had nothing to do with the diabetes.

The pancreatic structures, known as the islands of Langerhans, had for some time attracted the attention of investigators. The statement had been made a few times that possibly these islands furnish an internal secretion upon which the normal cycle of carbohydrate metabolism depends. Specific changes of the islands of Langerhans in connection with diabetes mellitus had not, however, been described until quite recently.

The islands of Langerhans normally consist of more or less spherical or irregular masses of cells found inside the secretory acini. From the latter they are separated, especially in man, by a very fine connective tissue membrane. The latter, however, is sometimes incomplete, so that the island cells rest directly upon the common secretory cells of the acini. The fact has been established that the islands of Langerhans are present in the pancreas of all mammalia, birds, reptiles, and amphibia, in which they have been looked for. The cells forming these islands are distinguished from the ordinary secretory cells, in that they do not, like the latter, contain characteristic granula in their outer zone, but have a homogeneous structure. The islands are not connected with the secretory ducts of the pancreas, but they stand in close connection with the surrounding tissue by large capillaries penetrating into the interior of the group of island cells. These blood-vessels are, in fact, intimately surrounded by the island cells, and no membrana propria or adventitia

[1] Read at the meeting of the Chicago Pathological Society, Nov. 11, 1901.

capillaris intervenes between the cells and the capillaries. The arrangement of the elements of the islands has suggested strongly the belief that they furnish an internal secretion, probably one connected with the sugar metabolism of the body (Laguesse, Schaefer, Dimare).

We now come to those recent observations concerning specific changes of the islands of Langerhans in diabetes.

Scobolew (Ueber die Structur der Bauchspeicheldruese unter gew. pathol. Bedingungen, *Centralbl. f. Pathol.*, 1900, vol. 11, p. 202), in a preliminary communication reported that he examined the pancreas in two cases of diabetes, and in both cases he could find no islands of Langerhans. He states that in animals ligation of the pancreatic ducts, followed by atrophy of the organ in general, does not affect the islands, and the tissue left consists practically of nothing but islands of Langerhans.

Opie (*Journal of the Boston Society of Medical Science*, vol. 4, No. 10, 1900; *Journal of Experimental Medicine*, Nos. 4 and 5, 1900) states that in the human pancreas the islands of Langerhans are more abundant in the tail or splenic end than in other parts, viz., three and a half times as numerous as elsewhere. He describes certain changes of the islands in diabetes and says that they are almost constantly surrounded by fibrous tissue, forming a capsule separating them from neighboring acini. Of eleven cases of diabetes examined very marked changes of the island were found in four. In his last paper Opie describes the pancreatic changes in a case of diabetes in a negro woman 54 years old. There was no generalized increase of interstitial connective tissue, but here and there, particularly in the tail of the organ, the fibrous stroma showed some proliferation. The islands of Langerhans, however, showed remarkable changes. In varying amount within almost every island was a homogeneous material staining with eosin. Only rarely was there an unaltered island found. Opie, in a more detailed description of the changes, says: "Those islands which are least changed contain a few scattered masses of hyaline material, of which the smallest are irregularly polygonal in shape, and correspond in size to the cells of the island. This hyaline substance at times lies in the midst of groups of cells, but is usually in contact with the walls of the capillaries, penetrating the island, or next the peripheral fibrous tissue, and is therefore usually between the remaining cells and the capillary wall. Increasing in amount, it replaces the cells, and where it is abundant the cells which still persist are small and contain small nuclei staining deeply with hematoxylin. . . . The

hyaline substance may occupy almost the entire area of the island." Opie also says that the hyaline material found is probably of epithelial origin.

There recently appeared in the Virchow number of the *Wiener Klinische Wochenschrift* (1901, No. 41, p. 968) an article by Weichselbaum and Stangel, upon the finer changes of the pancreas in diabetes mellitus. This classical contribution is based upon an examination of eighteen cases of diabetes mellitus, and it is preceded by a study of the normal pancreas. The eighteen cases were those of individuals ranging in age from 14 to 75 years. In almost every case death ensued in consequence of coma diabeticum. The authors studied the pancreas in each case in comparison with a pancreas of another individual of the same age, dead of some other disease. Comparison was also made with cases of atrophy of the pancreas not associated with diabetes. Since the paper of Weichselbaum and Stangel will undoubtedly be of fundamental importance for all those who for some time to come want to study the subject, we will give a somewhat extensive summary of its contents.

In all of the eighteen cases studied, with the exception of one, the pancreas showed macroscopically evidences of atrophy. The organ, while more or less normal in length, was thinner and narrower, and infiltrated with fat. The weight generally ranged between forty to sixty grammes. One case showed no changes of the pancreas, neither macroscopically nor microscopically. In this case a large cerebral glioma was found. In seven cases the inter- and the intra-acinar connective tissue showed abundant fatty changes, and the other cases also showed slight fatty alteration. In one case there was noticed a considerable increase of the interstitial, particularly of the intra-acinar, connective tissue, which was sclerotic and fibrous. Round-cell infiltration into the connective tissue was found in some cases; one case showed fat necrosis. In seven cases the smallest arteries of the pancreas showed sclerosis, their intima or their wall, as a whole, being thickened.

These observations on arteriosclerosis were, however, confined to individuals more than fifty years old. In younger diabetics the arteries were found normal. Special attention was directed to the islands of Langerhans. They showed more or less pronounced changes in every case. Their number was diminished not only absolutely, but also relatively; this fact was established by comparison with sections from identical parts of glands, either normal or coming from cases of other diseases, and from cases of atrophy of the pancreas without diabetes. Not in a single one of the cases

compared could there be found such a striking decrease in the islands of Langerhans as in diabetes. In one case of atrophy of the pancreas, without diabetes, the islands were apparently increased in number. The finer changes in the island are described as follows: In two cases hemorrhages were found in the insular tissue. Many islands were diminished in size in various degrees. They look narrow and irregular, as if compressed. The protoplasm of the island cells is slender, thin, or even decreased to mere filaments and granules. Often all of the cell bodies are so narrow that the nuclei are crowded and much nearer to each other than normal. Frequently the nuclei themselves are smaller and more oval, and they stain deeper than they normally do. The connective tissue in the islands with such small cells is increased, sometimes forming wide bands. There is, then, created a picture which reminds one of obliterated renal glomeruli. The glandular acini proper show the atrophic changes noticeable with the naked eye, also microscopically. The centro-acinous cells are more numerous in diabetes than in the normal pancreas, or in this gland in other diseases.

The authors believe that the increase in connective tissue in the pancreas, which increase is not very extensive, must be looked upon as secondary to atrophic processes in the parenchyma. They look upon the changes found in diabetes as a genuine atrophy, the cause of which is not known. Weichselbaum and Stangel state that they want to speak with some reserve in the final interpretation of their findings. They say: "The atrophy as found in our investigation appears to show the stigma of specificity, since it attacks much more the islands of Langerhans than the rest of the glandular parenchyma. In all other forms of atrophy we found the islands remarkably well preserved."

Since the publication of the papers of Scobolew and Opie, while working experimentally on some other problems connected with the function of the pancreas, I have examined this organ in five cases. In one instance I made a post-mortem examination and became familiar with all the details of the history of the case. For the material of the other four cases I am greatly indebted to Dr. Ludvig Hektoen. Of three cases I received small pieces of tissue only, coming from small, materially reduced pancreas in cases of diabetes (old museum specimens). In the fourth case I received the whole pancreas, which weighed between 90 and 100 grammes, showed no great amount of fat, and came from a very emaciated male, 30 years old, suffering from diabetes, and dead from a suppurative pleuritis and abscess, and gangrene of the lower right lobe.

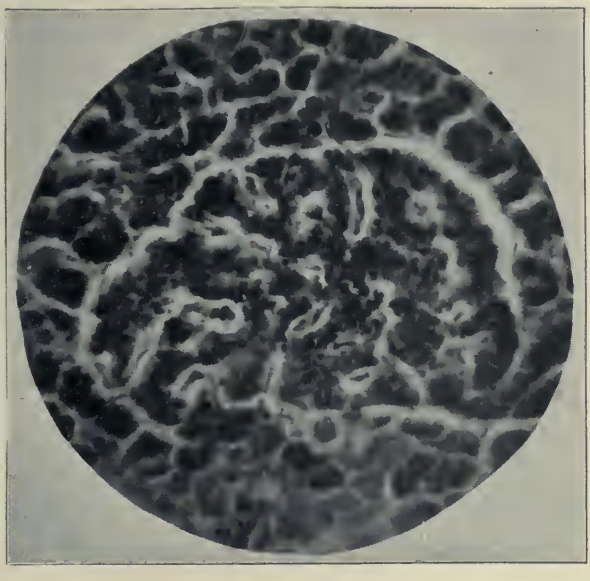

FIG. 1.—From the pancreas of a child 7 years old. Post-mortem examination four hours after death. The center of the field shows a normal island of Langerhans. Magnification: Spencer prof., ¼ inch; eye-piece 1 inch.

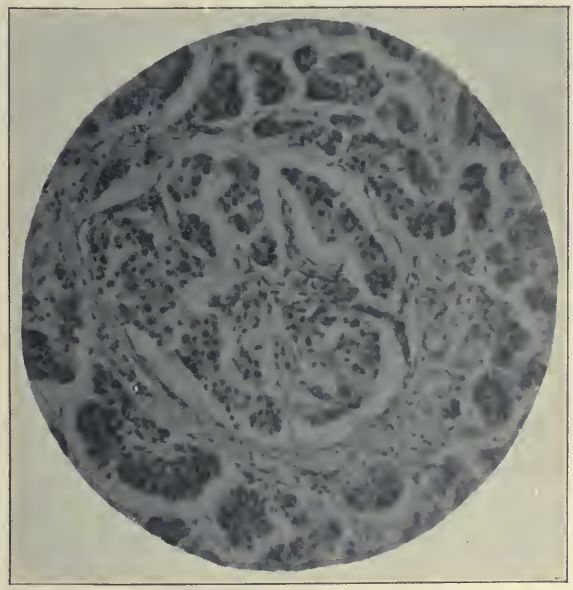

FIG. 2.—From the pancreas of a case of diabetes (Case 1). The island of Langerhans in the center of the field shows a thickened capsule and a slight degree of intrainsular fibrosis Magnification: same as Fig. 1.

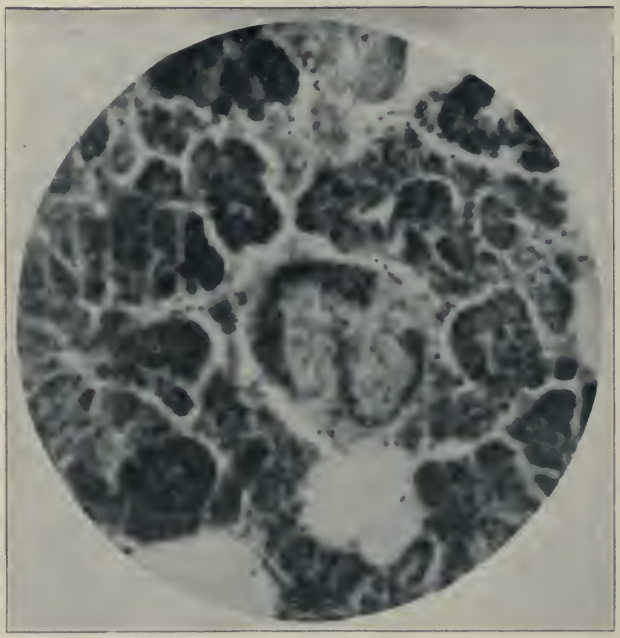

FIG. 3.—From the pancreas of a case of diabetes (Case 3). The island of Langerhans in the center of the field shows an advanced degree of hyaline degeneration. Next to the island is an open areolar space (fatty degeneration). Magnification: same as Fig. 1.

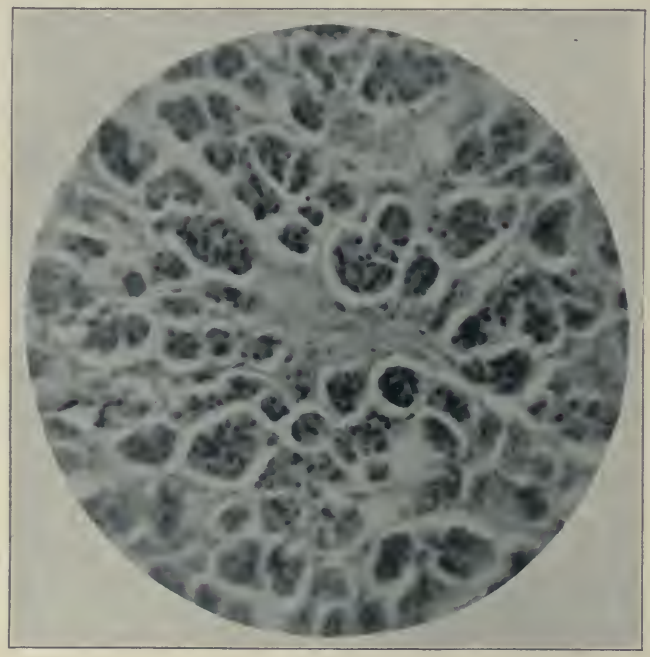

FIG. 4.—From the pancreas of a case of diabetes (Case 5). The center of the field shows a fibrous nodule, all that is left of what formerly was an island of Langerhans. Magnification: same as Fig. 1.

The examination of the five cases showed, as far as the main points at issue are concerned, the following changes:

Case 1 was that of a merchant, 42 years old. About a year previous to his death it was discovered that he was suffering from diabetes. He never had more than a moderate amount of sugar in his urine, but one year after the disease had been first noticed he developed an attack of diabetic coma, with acetone and β-oxybutyric acid in his urine, and died. At the post-mortem examination all organs were found normal, except that there was present a central pneumonia of the upper lobe of the left lung, and old fibrous adhesions of the left pleura to the thorax. The pancreas was normal in length, but reduced in thickness and width. The glandular tissue appeared diminished in bulk. The organ as a whole was somewhat harder and more nodular than normal, though it contained a moderate amount of fat. On section, the acini stood out more prominently than normal. Pancreatic duct open. No cystic enlargement. No stones or concretions. Weight of the organ, 75 grammes.

The microscopic examination of the other organs showed nothing of importance abnormal, except slight parenchymatous changes in the kidneys. In the pancreas the interlobular as well as the interacinar connective tissue is increased—moderately, on the whole, but there have also been formed here and there wide tracts of interlobular connective tissue, and the lobules contain small, atrophic acini. Here and there one sees small patches or tracts of open areolar tissue. The veins in this fat tissue are frequently found surrounded by dense inflammatory foci, composed of cells of the type of lymphocytes. With reference to the islands of Langerhans, the most striking change seen at once is a great thickening of the normally very delicate capsule of these structures. Some islands are quite large, others are small. In the latter the island cells look small and crowded, and some of them show signs of degeneration. The protoplasm in such cells is very faint, and the nuclei stain poorly, or not at all. Some of the islands show an increase of the intrainsular connective tissue. On the whole, the changes described, except those referring to the thickening of the capsule, are slight. In this case the histopathologic changes of the pancreas which might be looked upon as specific for diabetes were not much advanced. Perhaps the patient's death was not so much due to the comparatively recent and moderate diabetes, but to the central pneumonia which ushered in the diabetic coma, the direct cause of death.

Case 2.—The increase of connective tissue is more marked than in Case 1; the fatty changes particularly are much more extensive.

There are very few islands to be found — among them not one which is perfectly normal. Most of the scanty islands seen show a thickened capsule, few island cells, and an increased amount of intrainsular connective tissue. There was one mass found which had the outlines and the situation of an island, and which consisted of old fibrous connective tissue, very poor in nucleated cells. In another place there was found between the ordinary secretory parenchyma a roundish mass, the size of a small island, and consisting of hyaline material.

Case 3.—The interstitial connective tissue is moderately increased, and the fatty changes are likewise moderate. A number of fairly normal islands are seen. Many islands, however, in their center have their epithelial cells replaced by a more or less homogeneous material. The latter sometimes is made up of roundish masses looking somewhat like former and now swollen and degenerated cells. In other places the hyaline material looks more like swollen, coarse, and homogeneous old connective tissue, or it creates the impression that it might have been derived from degenerating obliterated capillaries.

Case 4 shows a marked, but moderate, increase of the interacinar connective tissue. There are hardly any islands to be found. Those very few seen are small, show some thickening of the capsule, but otherwise no well marked changes. Of this last case only a small number of sections were examined, and the few islands present were found with difficulty.

Case 5. — Several hundred sections from different parts of the gland were examined. The interlobular and the interacinar connective tissue are both increased, but quite moderately. Open areolar tissue is found in minute patches, but here and there only. Not in a single one of all of the sections examined could anything like an island of Langerhans be found. But in the center and near the periphery of some lobules — in other words in places where islands might have once been — there can be seen small irregular masses of connective tissue. These masses consist of some fusiform cells and many fine fibers without nuclei. These intralobular connective tissue foci are more numerous in the tail than anywhere else. It is quite astonishing to find how completely Langerhans' islands have disappeared from this pancreas, leaving as their remnants nothing but little irregular nodules of connective tissue.

The examination of these cases, with the exception of that of Cases 1 and 5, has hardly been carried far enough to warrant any far-reaching conclusions. But the result of the investigation is well

in accord with what has been recorded by Scobolew, Opie, Weichselbaum and Stangel. In our case No. 4, we were at first not able to see any islands in the sections, and only found them few in number and small in size, after repeated examinations. In Case 5 there were practically no islands found at all. Opie describes a hyaline degeneration of the islands, and this was noticed in our case No. 3, while the island changes found in cases 1, 2, and 5 were more of the character of a fibrosis. The island changes which Weichselbaum and Stangel describe consist mainly in atrophy of their epithelial cells and fibrosis, so that a picture is furnished which reminds the authors of obliterated renal glomeruli. The presence of real hyaline material is, however, not mentioned by Weichselbaum and Stangel.

ACUTE PHARYNGITIS OF THE STREPTOCOCCAL TYPE.[1]

BY LEWIS S. SOMERS, M.D., PHILADELPHIA, PA.

The cases furnishing the basis of this report were seen in a period of one week during the month of May, 1901, and in the peculiar characteristics of the angina present and the almost epidemic character of the affection, they are of sufficient interest from varied aspects to warrant a more or less detailed study of the phenomena present in this form of pharyngitis.

The aberrant character of the inflammation and its wide distribution, being the subject of a recent editorial note,[2] in which the disease is described as "coming on acutely, either with direct throat symptoms or making its first appearance with general manifestations, such as a feeling of chilliness, localized pains, and a rise in temperature, the local manifestations appearing some hours later, usually from twelve to twenty-four. The pharynx, as described, was intensely red and the tonsils swollen, one usually being more affected than the other. Numerous round or oval white patches dot the tonsils, and in part the pharyngeal walls, and are surrounded by a red, inflammatory areola; they are also present on the pillars, and at times are disposed in vertical rows. In some cases the pharyngeal involvement predominates, and the tonsillar swelling is but trivial. Pain in the back of the neck and on swallowing is present, together with other features of a severe tonsillitis. There is not much enlargement of the lymph glands, the urine is diminished in quantity, of a dark color, and has a high specific gravity, while the symptoms persist for two or three days and then quickly subside. Usually the patient is left quite prostrated, and both children and adults are attacked, while often several members of a family are taken down simultaneously or within a few days of one another. There are no complications as a rule."

The following cases of those seen are typical of the infection and show the various phases of the angina:

Case 1.—Miss M——, aged 40 years. Has had chronic sclerotic pharyngitis for a number of years, but is not subject to acute attacks of sore throat. Her general health is poor, and she is subject to frequent but mild attacks of muscular rheumatism. While under treatment for the chronic pharyngeal affection, she was seen on May 7, and the usual conditions were present without any evidence of

[1] Read before the North Branch of the Philadelphia County Medical Society, Oct. 17, 1901; also read by invitation before the Medical Society of Germantown, Dec. 9, 1901.

[2] *American Medicine*, April 27, 1901.

acute inflammation of the mucous membrane. Two days later, when she was again seen, the entire pharynx was inflamed, but not markedly swollen in any localized area; the vivid redness involved the pillars, tonsils, and post-pharyngeal walls, but not the nose or larynx. On both sides of the pharynx, behind the posterior pillars and jutting out beyond them, were patches of bluish-white membrane, slightly elevated above the surface, and readily removed on the slightest touch with a cotton-wrapped probe. The membrane was delicate, almost transparent, and to a certain degree showed the red hue of the underlying mucosa through it. The membranous areas were practically symmetrical and measured one-half inch in length by one-quarter of an inch in width. When removed it showed a slight erosion of the mucous membrane, as if a superficial layer of epithelial cells had been detached, and, undergoing necrosis, had existed as a part of it. There was pain on swallowing, but not of sufficient intensity to deprive the patient of food, although a mild degree of anorexia was present. Temperature was 101° F., pulse 110, and the bowels were constipated. The patient stated that she felt as if she were having a bilious attack in addition to the angina, the tongue being coated. She had had no coryza nor any acute inflammatory attacks of the upper respiratory tract previous to this. Calomel was given in minute amounts at frequent intervals until free movements were produced, the inflamed areas were painted with the tincture of the chloride of iron, and rhus glabra gargle was used every hour. Two days later there was only the slightest pain on forced swallowing, and all signs of the membrane and inflammation had disappeared. A few hours before the onset of the throat symptoms she complained of slight malaise, stiffness in the neck muscles, and some stomach disturbance as evinced by nausea. Under the microscope the membrane was composed of mucus, disintegrated epithelial cells, discolored and broken-down blood cells, and granular lymph cells with a considerable amount of fibrin. Streptococci were in abundance, and to a less extent staphylococci were also present, while rods were found in small numbers. No tendency to reform being noted when the membrane was removed.

Case 2.—Miss J——, aged 26 years. Is in fairly good health, but is subject to attacks of coryza and pharyngitis on exposure to any marked temperature change. She had been feeling perfectly well until May 10, when slight malaise was first noted, with some tenderness on movement of the muscles of the left side of the head and neck. She was first seen on the 11th, when she complained of the same symptoms somewhat increased and some sore throat. Exam-

ination showed the tongue slightly coated, the left anterior and posterior pillars and the pharyngeal wall on the same side were swollen and inflamed, while the remaining portions of the oropharynx and the respiratory tract were normal. The character of the inflammation was the same as in the previous case, but there was comparatively little swelling. The left tonsil was enlarged, and on the anterior surface of the posterior pillar was an area of membrane formation, differing in no respect from that seen in the previous case. The temperature was 100°, pulse 94, and the bilious element was present, but was not a predominant factor. The membrane was readily removed, and the parts were painted with tincture of chloride of iron; and she was instructed to dissolve the usual tonsillitis tablet on her tongue every two hours. By noon of the following day all the symptoms had disappeared and she felt perfectly well.

Case 3.—Miss F——, aged 22 years. Was first seen on May 9, when she stated that she has had chronic nasopharyngeal catarrh for several years, and was subject to attacks of peritonsillar abscess at frequent intervals. She had been feeling perfectly well, but on the day when she came under observation she awoke with a feeling of malaise and slight sore throat. The temperature was 100° F., pulse 120, and constipation was complained of. The pain in the throat was not severe enough to prevent her partaking of food, but the appetite was considerably impaired. She felt quite drowsy, and stated that while she frequently had sore throat, she never had an attack similar to this. The redness and slight swelling of the oropharynx was not diffused, but was limited to the tonsils and pillars. The tonsils were large and soft, covered with fibrous bands ramifying between the crypts, and the latter were prominent and patulous. On both sides and lying between the tonsils and the pillars, both anterior and posterior, were patches of the bluish-white membrane, corresponding in all respects to that observed in the previous cases. She was instructed to use the tonsillitis tablets and was given small, frequently repeated doses of calomel until the bowels were well moved. Twelve hours later, and forty-eight hours from the onset of the angina, all evidences of the affection had disappeared, except that she experienced great physical weakness for several days afterward. This was the only case observed which in any way presented a complicating factor, if such can be designated, as her throat remained free from any evidence of acute inflammation for two weeks, when a peritonsillar abscess developed, which was promptly evacuated and no further trouble was experienced.

Case 4.—E. H.——, male, aged 11 years. Has always been a

healthy boy, and has been brought up with exceptional care. He has a mild degree of postnasal catarrh which has existed for nearly a year. He was first seen on May 11, when it was ascertained that he had complained of malaise for two days previous in connection with the usual symptoms of a bilious attack, such as headache, constipation, coated tongue, and some impairment of appetite, but there had been no vomiting. He complained of sore throat which developed suddenly on the day previous to his first being seen, but it did not prevent his eating solids, and no marked pain was caused on swallowing. The tonsils were fairly large from chronic hyperplasia, and were also increased in size at this time by the superadded acute condition. The pharyngeal wall was but slightly reddened, and the pillars participated in the inflammation to a somewhat greater extent. On both tonsils, but nowhere else, was the thin, bluish-white membrane previously described in the other cases, and with but slight surrounding inflammation, more in the nature of acute congestion than marked inflammation. The temperature was 99° F., the pulse was 100, and the urine febrile. The treatment was the same as in the preceding case, and on the following day the bowels had moved freely, he felt greatly improved, and the pharyngeal soreness and congestion had disappeared, although the membrane remained unaltered both as regarded its physical appearance and its location. The following day all the symptoms had completely disappeared, including the membrane, and he has since had no further attacks. The membrane differed in no respects histologically from that found in the other cases, but he presented in many ways the features of diphtheria, and the child was isolated until cultures could be made, which showed a negative aspect as regarded the presence of the Klebs-Loeffler bacillus, but streptococci were found in abundance, and staphylococci, as in the others, to a less degree.

All the cases which came under my observation at this time presented features identical in several respects: the presence of the same bacterial agencies, the complex of bilious symptoms, the febrile phenomena, and the rapid disappearance of the membrane in conjunction with all the symptoms except a feeling of severe exhaustion, which depressed the patient for several days after the other phenomena had completely disappeared. The infection in all was of an attenuated type, both as regarded the general and local symptoms, and in this respect differed from the usual streptococcic angina as seen in connection with some of the acute infectious diseases such as scarlet fever, with its angina as an essential part of the disease.

The first question to be decided, and the one of greatest moment when such a case comes under observation, is to determine whether the membrane present in the throat is that of diphtheria and due to the specific organism of that disease, or whether it is due to some other bacterial agency, as in the cases here cited. The clinical history and the evidences presented by the throat examination may enable one to say that the membrane is not due to the Klebs-Loeffler bacillus, but is due to other organisms the nature of which may be determined later, as was plainly evident in my first three cases. But in the fourth the diagnosis could not be determined in such a manner, as both the history and local signs were as much in favor of diphtheria as that of streptococcic or staphylococcic infection, and the true nature of the condition was only cleared up by the bacterial findings.

The limited area of membrane formation, or even the entire absence of membrane, in an otherwise catarrhal angina does not necessarily indicate that the Klebs-Loeffler bacillus is absent, as this organism in the early stages of diphtheria may produce small translucent membranous patches in no way distinguishable from those seen in these cases except as recognized by a differential bacterial examination. It must also be remembered in this connection that this organism may for a time produce only the evidences of catarrhal inflammation, and in a sufficiently recorded group of cases the bacillus of diphtheria has been found in the healthy throat. The question of the severity of the symptom-complex, therefore, is not only one of the nature of the bacterial agent present in a given case, not only the individual resistance of the cells to the infection, but to a great extent is dependent upon the virulency of the major group of organisms recognized in the throat at the time of the infection, and to a lesser extent to the complicating effect of other extraneous organisms also associated in the same case.

Usually the streptococcus infection presents a more grave aspect than was observed in these cases, and in the majority of the so-called membranous sore throats the duration of the infection is greatly lengthened. The type of the usual streptococcic angina is that seen in severe cases of lacunar tonsillitis, and as before mentioned in the various septic forms of angina, especially subsequent or accompanying some of the acute infectious diseases, the clinical resemblance to diphtheria only being differentiated by the bacterial study.

The tendency to invasion of the normal mucosa of the pharyngeal

region by pathogenic organisms is, like the other tissues of the body in a similar state of health, somewhat limited, and as shown by these cases in a wide-spread angina of this character, the first to become and often the only ones affected are those in whom the local resistance of the tissues is below par; all of the cases coming under my observation at this time being the subjects of previously existing catarrhal changes. The exceedingly short and abrupt course of the disease was particularly emphasized in all the cases, and from the nature of the defective throats in which the angina occurred this aspect is rendered all the more remarkable, as one would expect not only that the disease under such circumstances should be of a more severe grade than here presented, but also that the duration should have extended over a much longer period of time.

That this was not the case cannot be accounted for by any local or general treatment instituted, for as a rule the isolated instances of streptococcic angina limited to the pharyngeal wall, and those frequently seen assuming the aspects of a lacunar tonsillitis, are much more resistant to medication. The assumption, therefore, that the comparatively mild character of the infection was the result of an attenuated coccus becomes plausible, and seems undoubtedly in these cases to be the only rational explanation of this feature of the affection. The contagious character of the organism under these conditions was not manifested in any of my patients, and in this respect apparently differed from those seen by others, as in no instance did the affection occur in any two or more members of the same family, or in the same house, either at the time of observation or at a later period.

The correlation of the gastrointestinal symptoms, such as the disturbed appetite, nausea, constipation, and coated tongue, is inseparably connected with almost all the acute inflammatory affections of this particular locality. Yet as a matter of fact the association of these symptoms is but a part of the local process, as careful examination in the majority of cases, and in every one of these particular cases, will show; the membrane formation and inflammatory changes are limited to particular regions, characterized by the presence of a surface covering of squamous epithelial cells, and in no instance did the swelling or inflammatory phenomena extend to the tissues protected by ciliated cells. In other words, the infection was limited solely to the upper portion of the alimentary tract, and seemingly exempted the respiratory portions, although at this point the two tracts are in intimate relation and cross one another; the predisposed area of membranous exudation being that covered by squamous

epithelium such as covers the tonsils and oropharynx, as illustrated in the vast majority of cases of diphtheria, in which the primary infection is limited to this locality and extends only to the areas protected by ciliated epithelium, such as the nasopharynx and larynx, when the tissue resistance is much diminished or the virulency of the infection is greatly augmented. And in all acute inflammations of this portion of the economy, characterized by membrane development, in which the ciliated epithelial surfaces are involved alone or bear the brunt of the affection, the associated gastrointestinal symptoms are absent or correspondingly diminished, the reverse being true when the squamous epithelial areas are subjected to an inflammatory process.

The recognition of the presence of membranous exudation in the pharynx should as a rule occasion no difficulty, but in a certain number of patients localized areas of epithelial necrosis, especially when the desquamating epithelium is partially detached in the presence of a complicating simple angina, are difficult of recognition by visual examination, and considerable doubt may be entertained until a careful history of the affection has been elicited; especially is this so in herpetic pharyngitis when seen, as is usually the case, after the vesicles have macerated and ruptured, and it is also true to a much less extent in leucoplasia, mycosis, and some of the aspects of syphilis. As pointed out by Rethi[1] the small round epithelial plaques sometimes observed in influenza and situated upon the soft palate and tonsils, due primarily to necrosed and thickened portions of the epithelium, occasionally assume a membranous aspect. Little difficulty, however, should be experienced in separating these from a true exudation, as they are limited in extent, have no tendency to encroach upon immediate areas, and if a small patch be placed under the microscope it will be found to consist simply of detached epithelial cells.

While the postulates of Koch have not been successfully complied with in the various forms of membranous angina, yet one is at present compelled to accept the predominate organism in the given case as the chief etiological factor in the production of the inflammation, and as various microörganisms are productive of well defined exudative inflammations in this region, a classification based upon the nature of the organisms present would do much toward elucidating the various forms of angina in which this feature is prominent. The term membranous angina, which is used by many to cover the entire group of cases belonging to this class, means but little, while

[1] *Wiener Medizinische Wochenschrift*, No. 1, 1894.

specific terms such as staphylococcic or streptococcic angina particularly designate the nature of the individual affection, and the knowledge of the individual germ or group of germs present in a given case is of immense value in both a prognostic and therapeutic sense.

Massei[1] has grouped the microörganisms, which in the oropharynx produce at times membranous exudation, into three classes: First, those of the coccus forms, as the staphylococcus, streptococcus, and pneumococcus, and Roux's coccus; secondly, bacillus forms, as the Klebs-Loeffler, colon, and leptothrix; while the remaining class is composed of other fungi, such as the oidium albicans. While one form usually predominates and lends its more or less distinct character to the type of angina, the infection is practically always mixed, and the exudate is influenced not so much by the nature as it is by the severity and degree of the process.

[1] *Riforma Med.*, part i, 1895.

BOOK REVIEWS.

A Text-book of Surgery. By Dr. Hermann Tillmanns, Professor in the University of Leipsic. Translated from the Seventh German Edition by Benjamin T. Tilton and John Rogers. Edited by Louis A. Stimson. Vol. I: The Principles of Surgery and Surgical Pathology. New York: D. Appleton & Co. 1901.

The third German edition of Tillmanns's Surgery was translated into English. Since then four new German editions have appeared. The progress which has since been made in pathology and bacteriology makes it essential that a new edition ahould be issued if the work is to be brought up to the present time. The first volume contains a complete exposition of general pathology and bacteriology; it also treats of injuries of special tissues, their treatment, tumors, general surgical technique, and bandaging. The work is to be completed by two additional volumes, which will include a description of the surgical diseases and injuries of the different regions.

The work opens with a definition of a surgical operation which is said to be "any mechanical interference of the surgeon, undertaken with a view to remedy disease, in which interference surgical instruments are used." The writer further divides operations into those in which blood is lost and those in which no hemorrhage occurs. Then follows a detailed account of the preparation of the patient, of the rules governing an aseptic technique. This, and the subsequent portions of the work, contain detailed accounts of every step in surgical operations. There are cuts given of the different styles of operating tables, of the methods of placing sheets and towels about the patient, and careful directions are given as to the methods of sterilizing wounds, the preparation of instruments, etc. In the preparation of the work it is evident that the author has assumed that the reader is ignorant of surgical methods; hence it is peculiarly adapted for the undergraduate, and is a model for a text-book which takes nothing for granted on the part of the student. The article upon the method of relieving pain during operations is quite full; the author leans strongly toward the use of ether for general anesthesia. Local anesthesia by the application of solutions of cocaine and Schleich's infiltration anesthesia are described. There is no mention of spinal analgesia, which seems unpardonable in a work issued as late as 1901, and which, albeit a translation, has an American editor.

In the methods of controlling hemorrhage, the writer refers to the ancient tourniquet and to digital compression, stating that all these have yielded to the Esmarch method. There is brief mention of the use of lock forceps in preventing hemorrhage during an operation, but the best forms of these forceps and the manner of using them are not described. All the usual methods of controlling hemorrhage are described. As an instance of the care with which the details of surgical technique are described, there is an account of the method in which rubber drains are prepared from rubber tubing. The different forms of suture material, their preparation, and method of introduction are described, but singularly the subcutaneous suture, the best of all methods of closing a skin wound, is not mentioned. The various plastic methods, particularly that dealing with skin-grafting, are described, together with a brief men-

tion of the plastic operations which have been performed upon tendons, nerves, muscles, and bones. There is an extensive discussion of antiseptics as used in surgery, and of other dressings for treating wounds. The continuous bath method is commended, as well as the use of antiseptic wet dressings.

There is a chapter on the application of bandages, suspension, and the preparation of the bed for surgical cases. This concludes a portion of the volume dealing more especially with surgical technique. We know of no work better adapted to place the undergraduate in possession of the essential facts that are so often neglected by teachers who assume that such elementary knowledge must certainly be in the possession of their pupils.

The concluding section deals with surgical pathology and therapy. The first chapter discusses inflammation, delirium, and surgical infections. There is an exhaustive description of the injuries and surgical diseases of the soft parts, bones, joints, and finally an appendix dealing with gunshot injuries. The last chapter in the book deals with tumors from a pathological standpoint.

The volume contains a wealth of illustration, but some of the plates show considerable wear. The typography of the book is excellent.

A Text-book of Obstetrics. By Barton Cooke Hirst, M.D. Third Edition. Price, $5.00. Philadelphia and London: W. B. Saunders & Co. 1901.

Soon after the appearance of Hirst's Obstetrics, it took its place as the leading text-book upon obstetrics in the English language. Within a short time three editions have been called for, the last showing some increase in size, the work now containing 873 pages. New matter has been inserted in this edition upon the diagnosis and pathology of pregnancy, the pathology of labor, and obstetrical operations. Some fifty new illustrations have been added, including three colored plates. In all the work contains 704 illustrations, six of them in colors. The work is handsomely printed, the illustrations are all clear, and the most of them are original. Every portion of the work shows the abundant practical experience of the writer, and that he is a teacher of experience. The book, both in its arrangement and style, is a model of text-book construction.

It is not our intention to enter into an exhaustive review of this work, as former editions have received extended notice in our pages. We desire especially to direct attention to certain chapters in the current edition which are worthy of commendation. The diagnosis of pregnancy begins with a description of a few of the striking errors which have been made in mistaking pregnancy for other conditions, and of numerous cases of pseudocyesis. The signs of pregnancy are arranged in their natural order, beginning with the subjective statements of the patient, which include, in the order of their importance, cessation of menstruation, nausea and vomiting, changes in the size and shape of the abdomen, changes due to increased blood-supply to the genitalia and breasts, quickening and alterations of the nervous system. These conditions are all adequately illustrated.

The article upon puerperal sepsis attributes the foundation of our present knowledge to the paper of Oliver Wendell Holmes, the observations of Semmelweis, and the publication of James Y. Simpson's paper upon the relation of puerperal and surgical fevers. Reference is made to the controversy between Hodge and Meigs, who were powerful opponents of the doctrine of the con-

tagiousness of puerperal fever, and Holmes. To Semmelweis is given the credit of having demonstrated the contagiousness of puerperal fever. The effective study of the subject is said to date from Doderlein's paper published in 1892. The conclusions of Doderlein are (1) that all pathological secretions swarm with saprophytes and with many pathological germs, and are weakly acid or alkaline; (2) that in a puerpera the vaginal bacillus disappears, and in its place are found many kinds of saprophytes, the lochial discharge being alkaline; (3) that when the lochia ceases the saprophytes disappear, the vaginal bacillus reappears, and the vaginal secretion becomes again intensely acid. The views of Doderlein have not been universally accepted, but in the main they are correct, and constitute an advance in the knowledge of the subject more important than has been achieved by any single individual.

The writer states that in the majority of puerperal infections the germs are carried directly into the genital tract by the hands of the attendant, and there is no surer way of preventing puerperal infection than by avoiding vaginal examinations. Epidemics of puerperal fever in hospitals have been quickly stamped out by omitting digital examination, and the best mortality records have been attained in institutions in which vaginal examinations were eliminated as much as possible. Putrescent material within the uterine cavity especially attracts innumerable saprophytes, which frequently results in a toxemia, and may lead to an invasion of pathological germs. The writer believes in autoinfection, such as the infection of the genital canal from an old pyosalpinx. The parturient woman may have been the subject of an interstitial endometritis and the activity of the germ be set up after labor.

In the treatment, prophylaxis is enjoined. Serum therapy in puerperal sepsis is discussed, the writer stating that after a personal trial extending over three years and including twenty cases he has abandoned the treatment. The artificial production of a hyperleucocytosis is a plan which promises practical results.

In speaking of the surgical treatment of puerperal sepsis he says: "It is extremely difficult to lay down correct rules for the guidance of a physician in a situation involving so much responsibility, and, of necessity, so dependent upon many circumstances as that seeming to require a very serious surgical operation in the midst of an adynamic fever, with, very likely, profound depression, rapid pulse, high temperature—in short, everything that a surgeon least desires in the face of a major operation. The attendant should avoid the operative treatment of puerperal sepsis if possible, and should not seek an excuse for surgical intervention merely in the cardinal symptoms of septic infection—high temperature, rapid pulse, and general depression. He should demand some tangible evidence of those forms of sepsis that are amenable to surgical treatment. The physician, while reluctant to operate upon a patient under unfavorable circumstances, must be prepared to take the responsibility when the indications arise. When there are signs of diffuse suppurative peritonitis, the abdomen should be opened without a moment's delay, but even then the inflammation commonly extends so rapidly that there is little hope of saving life. Prompt intervention should also be exercised where there is an accumulation of pus in the pelvis."

Symphyseotomy is an alternative of version in contracted pelves. The woman with a conjugate diameter of over seven centimeters should be allowed to remain in active labor twenty-four hours. If at the end of that time the head

is not engaged, axis traction forceps should be applied and an attempt made to engage the head. If after twenty minutes of intermittent traction the head is not engaged, a choice should be made between version and symphyseotomy. The former is almost always practicable with a conjugate above seven centimeters, but the mortality of infants is about 43 per cent. The latter practically insures a living child, but is distinctly dangerous to the mother. In the application of these methods the woman and her husband should have some voice in the decision.

PATHOLOGICAL TECHNIQUE. By Frank Burr Mallory, A.M., M.D., and James Homer Wright, A.M., M.D. Second Edition, Revised and Enlarged. Philadelphia: W. B. Saunders & Co. 1901.

This work of 432 pages is designed for practical use in the laboratory, and as a guide to beginners in the study of pathological anatomy. In the arrangement of the work the writers have followed the natural division, beginning with the gross inspection of the body and such coarse dissection as constitutes only the beginning of an autopsy. Then follow the bacteriological, histological, and chemical examinations which lead to a solution, if within the means of modern research, of the pathological problem.

The first part of the work deals with post-mortem examination, the methods of making the incisions, the instruments employed, and the gross appearance of the organs.

The importance which bacteriological methods have assumed in modern pathological work is shown by the fact that one-third of the entire volume is devoted to this department. The writers begin with the preparation of ordinary culture media; then follows a description of the methods of staining, cultivating, and inoculating bacteria. The remaining portion of the work is devoted to histological methods, which include the hardening, embedding, and sectioning of tissues for microscopical examination.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. By John V. Shoemaker, M.D., LL.D. Fourth Edition, Revised and Enlarged. New York: D. Appleton & Co. 1901.

The numerous editions of Shoemaker's Diseases of the Skin have been referred to in recent pages of this journal, so that an extended notice of the present volume is scarcely necessary. The work has been revised to correspond with the advances of the last three years. Like the editions that have preceded it, especial stress is laid upon the therapeutics of diseases of the skin. But brief reference is found to recent discussions of mooted points in the range of dermatology, particularly in reference to the parasitic origin of malignant growths. The late studies in the bacteriology of many skin affections are reflected in the treatment recommended for these disorders.

The work forms an extensive treatise on diseases of the skin. It contains 892 pages, nearly 100 of which are devoted to a formulary containing prescriptions arranged in reference to the use of certain drugs, and also those that are classified according to the skin diseases in which they are useful. The prescriptions are all written in English, and the equivalents in the metric and apothecaries' weight are given. A number of new colored plates have been added to this edition.

DOSE-BOOK AND MANUAL OF PRESCRIPTION WRITING. By E. Q. Thornton, M.D., Ph.D. Second Edition, Revised and Enlarged. Price, $2.00. Philadelphia: W. B. Saunders & Co. 1901.

The author has produced a useful book for the student and the practitioner. It is valuable for reference, giving information regarding drugs and their preparation in a condensed form. The writer opens with a brief introduction, and then follows a consideration of weights and measures, discussing both apothecaries' and metric weights. He leans distinctly toward the metric system, and tables are given for converting apothecaries' into the metric system. To those who still adhere to the older method of writing prescriptions, a study of this first chapter will enable them to use the metric system with precision. The chapter on prescription writing is clear, and there is an excellent chapter upon incompatibles. The main portion of the work is devoted to the official preparations and methods of prescribing, and a list of remedies which includes the commoner remedies together with their preparation and doses.

THE DIAGNOSIS OF DISEASES OF THE CORD. By Dr. Grasset. Translated by C. Solis, M.D. Ann Arbor, Michigan: George Wahr. 1901.

The profession is indebted to Dr. Solis for translating Grasset's work. It is a valuable little work on the topographical diagnosis of diseases of the spinal cord, which is now essential for the general practitioner as surgical intervention becomes more common. The clinical topography of the cord is now sufficiently understood, so that a limited lesion can be accurately located, not only with reference to the conducting paths of the cord, but also in reference to the height. The work is divided into two parts: the first deals with the system diseases of the cord, which include the anterior and posterior columns, etc.; the second part deals with the methods by which lesions are located. Two elements enter into the regional diagnosis of cord lesions, namely, the breadth of the lesion and its height. To the solution of these problems Dr. Grasset brings a wide clinical knowledge.

A LABORATORY COURSE IN BACTERIOLOGY. By Frederick P. Gorham, A.M. Price, $1.25. Philadelphia: W. B. Saunders & Co. 1901.

This is a small work of 192 pages prepared by the Associate Professor of Biology in Brown University, for the use of medical, agricultural, and industrial students. It is essentially a laboratory study, as the writer says that bacteriology can only be taught in such a manner as to serve a useful purpose in the laboratory. As bacteriology is no longer confined to the medical schools, this small volume has been prepared to serve for beginners in bacteriology, no matter what their occupation shall subsequently be.

The work, as stated on the title-page, is simply a laboratory guide, amounting to a mere statement of what the student should do and what he should look for. It begins with the most elementary facts in bacteriology, and gradually advances to the more complex. There is scarcely any text, hence it is only useful at the laboratory table.

EDITORIAL COMMENT.

TO IMPROVE THE RACE.

As showing the extent to which State socialism is progressing, we call attention to a recent report of a lecture by Francis Galton, being the Huxley memorial lecture delivered before a brilliant and scientific audience. The report of the lecture comes to us through the *Chicago Record-Herald* of October 30, 1901. According to the telegraphic account, it is suggested that public and private bonuses for physically and intellectually perfect young married couples be given. In his address Dr. Galton said:

"High civic worth includes a high level of character, intellect, energy, and physique. Young men and women possessing these qualities should be encouraged to marry. Examinations should be held to determine their fitness, and diplomas of fitness should be granted by the State. Considering the great moral and civic worth of children born of ideal parents, the State can well afford to give dowries to perfect brides.

"We know the worth of a baby born to an average Essex laborer, costing and earning an average amount in the course of its life. It is worth five pounds. We know the worth of a baby born of perfect parents and living a normal length of time. It is worth thousands of pounds at the moment of its birth. Babies of this class grow up to increase the wealth of multitudes and to amass large fortunes themselves. They are of immense value to nations because of their intellectual and spiritual stimulus.

"Many girls shrink from marriage on prudential grounds. We should make it imprudent on the part of any girl of the best class to refrain from marriage. Rewards for extra children might be expected to add an average increment of one adult son and one adult daughter to the offspring of every favored couple. Philanthropists, accustomed to befriend promising youths, should extend help to promising couples. Landowners might offer low rents and good cottages to desirable persons just wedded. Noble families might gather fine specimens of humanity around them, just as exercise and care produce fine breeds of cattle.

"Finally, there should be building societies with higher ends than mere investments. They should be endowed with princely generosity that they might maintain settlements of selected persons who would be housed in rooms for a term of years at low cost. Such

a class would create through its own merits an attractive settlement distinguished for energy, intelligence, and civic worth, just as a first-class club attracts desirable candidates with social advantages. I am aware of the magnitude the inquiry suggests. It is great, but the object is one of the highest man can hope to accomplish. There seems no reason to doubt its practicability in a greater or less degree."

If the distinguished lecturer is correctly reported, he has enunciated as strikingly socialistic a doctrine as that of Carl Marx. The rapid tendency of government toward socialism has been apparent during the past two decades, but it is only within the last few years that the impetus has received marked acceleration. Public schools, hospitals, free baths, were the first steps, and it is but a short cut to municipal restaurants such as are found in Sweden; compulsory State insurance as in Germany; and at last we have an applauding audience in staid old England accepting under a modified nomenclature the stirpiculture advocated by the head of the Oneida Community a few years ago.

It would be quite interesting to know how the economics of this subject developed. We should be enlightened if the exact formula were given by which the lecturer arrives at the opinion that a baby born to an Essex laborer is worth five pounds. We should also be interested to learn how a baby born under these new conditions of perfect parents should be worth thousands of pounds. We fancy that these figures must have been arrived at by some such mental process as is employed by the average American statistical writer, when he discusses the death-rate of typhoid fever, and values every life destroyed at $5000.

The essayist proposes to establish an aristocracy of the fit who are to associate together, the society of which is to be rendered attractive because of their energy, intelligence, and civic worth. We confess that we do not see much change from the present system. It is common for the intelligent, refined, energetic, and reputable to associate, just as there is a distinct tendency in the degenerate, neurotic, and criminal classes to mingle and to intermarry. By some the latter is thought to be a conservative process, as it eliminates the defective strain in the course of a few generations. In the system proposed by Galton he makes no mention of the unfit and the imperfect; we are not told whether they are to be permitted to marry, or simply to be taken out and drowned.

Galton, together with a number of economic writers, is imbued with the idea that economic progress is largely dependent upon an

increase in the population. Suppose that the population of the United States were suddenly doubled. The distress would be inconceivable; many would die of sickness, others of famine—a generation would elapse before there was an adjustment of the sudden increase in population to economic conditions. In our opinion the United States would not be a pleasanter place to live in if it had one hundred and fifty million population than it is now. There might be something more for the politicians to rave over, namely, that it was one of the largest nations in the world and could produce the largest standing army; but wherein would the happiness and enjoyment of life of the individual be enhanced? State socialism may be a good thing, and possibly may be an ultimate necessity, especially if the world goes on increasing in population as rapidly as it has during the last half-century.

Famine, war, and pestilence as checks to a rapid increase in population have been largely eliminated by modern civilization. Of late there is a tendency to substitute these destructive factors by a diminishing birth-rate. This is alarming many economic writers. For our part we do not share in this anxiety, believing that if the population did not increase a million a year for the next fifty years it would be none the worse for ourselves or posterity.

MASSAGE AND OSTEOPATHY.

The founding of a special school of medical practice called osteopathy directs attention anew to the value of manipulation in the treatment of certain diseased conditions. Some have described osteopathy as a highly scientific massage; but the ordinary rubbing, kneading, and tapping prescribed in the works on massage and practiced by masseurs are very different things from the manipulations of the osteopaths. The latter are based upon the anatomical structures to be treated; sufficient force is employed to affect the deeper tissues. In improving the circulation, relieving pain, and absorbing inflammatory exudates by manipulation, the average osteopath is capable of teaching the profession valuable lessons. Of course, the foundation of a school of medicine upon such a narrow therapeutic resource will ultimately bring the whole movement into discredit, and perhaps a valuable method of treatment in a certain class of cases may fall into disuse. Had osteopathy confined itself to a legitimate application of its methods, and not attempted such absurdities as the "reduction" of typhoid fever by pressing upon the seventh cervical vertebra, it would probably have left a valuable

impression upon the practice of medicine. Its fallacies will sink whatever is of good in the method.

In Japan the blind are trained in massage. In Leipsic a number of blind people have been trained to the occupation. The massage that is taught is the ordinary rubbing and kneading and stroking with which most bath attendants are familiar. It is useful in general neurasthenic states and where a general improvement in the nutrition of the tissues is sought, or as a form of passive exercise in patients who are inactive. Such massage differs from manipulations based upon a careful appreciation of the anatomic elements involved in the structures which are treated, and knowledge of the vascular and lymph channels. It is unfortunate as well for the laity as for the profession that such manipulative methods have ever been allowed to pass into the hands of empirics. In Austria massage by the laity has been discouraged; it is in the hands of medical students and young medical men. In some way physicians have thought that such manipulations were beneath the dignity of the profession. This must be a relic of the time when the operation for stone was considered one that a surgeon should never perform. No one is so competent to deal with the adhesions in a joint and inflammatory exudates in the pelvis as physicians themselves. Indeed, there are many reasons for thinking that the physician alone is competent, as he is able to appreciate such dangerous infections as tuberculosis, which might be aggravated by manipulation. Massage and manipulative measures generally should be restricted to the profession. The older members whose time is too fully occupied to give the personal attention required in these cases should enlist the younger members of the profession in the work. When the profession fully awakens to its responsibility in this respect, much of the quackery which now flourishes will find itself relegated to the rear.

DRUNKENNESS LEGALLY DEFINED.

Strangely, the law has attempted no definition of drunkenness or intoxication. Judges have not felt it necessary to say that a knowledge of right and wrong or of power to refrain from doing a thing was an adequate measure of the degree of intoxication. It has largely been left to the jury, though witnesses have been allowed to give their opinion as to whether a man was drunk or sober, subject to cross-examination. Generally there has been a tendency toward restriction of such a simple opinion, preference being given to a description of a man's actions. We have felt that if the slang

phrases of the day, such as "jag" and "still," which express fairly well the degrees of intoxication, could be incorporated in our jurisprudence it would add not a little to the ease with which the law is administered. It is evident that the term intoxication or drunkenness, as is commonly used in an ordinance, may mean anything from that slight incoördination of the lower extremities which causes a man to stumble against his neighbor, up to a degree of intoxication that fulfils Lord Hale's definition of insanity, namely, "that he shall be so far bereft of reason and understanding as to know no more than a wild beast."

A unique decision was recently given by Judge Dewey of the Central Municipal Court of Boston. One Brick, who is an alderman of Boston, and a political leader of some prominence, was recently brought before him. It was charged that while attending a political caucus he howled, knocked people down, broke furniture, and made himself a general nuisance. Upon these facts the police came to the conclusion that he was "tight," arrested him, and took him before Judge Dewey, where he was charged with drunkenness. The judge, after listening to the evidence, gave an exhaustive opinion upon the different degrees of intoxication, finally falling back upon the definition found in the Century Dictionary: "Drunk—Intoxicated, inebriated; overcome, stupefied or frenzied by alcoholic liquor; used chiefly in the predicate." The police were certain that the defendant was drunk, intoxicated, inebriated, but they could not affirm that he was stupefied or frenzied by alcoholic liquor; hence Mr. Brick was discharged.

THE KEEPING QUALITY OF ANTIDIPHTHERITIC SERUM.

A prominent British pharmaceutical journal, the *Chemist and Druggist*, in a late issue quoted the French Minister of the Interior as follows: "It frequently happens that when physicians have antidiphtheritic serum which is a few months or even a few weeks old, they will not use it, and prefer to wait for a fresh supply. In this way precious time is lost, and even the life of the patient is endangered by the delay. Medical men certainly may get new serum if they judge it necessary, but they should immediately use that they have in hand. Repeated experiments have shown that the serum loses none of its curative qualities by being kept even for a year."

The impression seems to prevail among the profession at large that a serum, to be efficient, must be of recent preparation; in other words, that it is liable to rapid deterioration. The statement of the French Minister should have a reassuring effect, particularly since it is based, as we understand, upon a large number of experiments.

It is a well known fact that the leading American manufacturers have time and time again tested supplies of antidiphtheritic serum returned to them for exchange after intervals of six months, nine months, and even more than a year, with the remarkable result that in almost every single case the serum thus tested has exhibited a potency equal to that claimed for it. To guard against possible deterioration in strength the number of antitoxic units represented by the contents of a single bulb is always in excess of the number stated on the label.

In view of these important facts the corollary obviously follows that when a positive diagnosis has been made, when the indication for antidiphtheritic serum is plain, and where the circumstances are such that every moment saved offers greater hope of success, a reliable brand of serum may and in fact should be used, though it be eight, nine, or ten months or even a year old. We believe, moreover, that it would be in the line of duty to use serum of that age even in a mild case of undoubted pharyngeal diphtheria, should no more recent specimen be available. Finally, in the face of threatened danger, where prompt action may avert a fatal termination, no doubt should be permitted to cloud the judgment of the medical attendant, but the serum should be given without delay and in liberal quantities. We are firmly convinced that the loss of antitoxic strength of a reliable brand of antidiphtheritic serum is much less than has been heretofore assumed.

THOUGHTS SUGGESTED BY A PROPOSED "OLFACTOSCOPE."

Of all the senses available in the diagnosis of disease, that of smell is the least useful to the medical man. In our standard textbooks there are practically no references to the nose as a diagnostic organ. There are occasional references to the odor of the insane, which is quite obvious in certain asylum wards, and which has been claimed by some writers to be due to a want of cleanliness on the part of the caretakers. Some physicians claim that they can diagnosticate smallpox by the odor, and diphtheria and measles are said to give off an effluvia the character of which is readily recognized by the specially trained nasal organs of some medical men.

It is well known that the power of distinguishing odors is much more acute in some individuals than in others, but unfortunately the general consensus of opinion is that the differentiating power of the medical olfactory organ does not average very high, and consequently the sense of smell will never be widely available in the diagnosis of disease.

An article in the *Texas Medical Journal* for October, 1901, by Lucian Lofton, proposes to utilize the sense of smell in searching for a perforation of the intestines. He describes an instrument which we have ventured to call an olfactoscope; it is composed of a small glass tube about twenty-four inches in length and one-half inch in circumference, expanded at one end like an ordinary funnel. Its distal extremity is conical. The tube is sterilized and bent at a convenient angle, and then, according to the writer, it is "carefully permitted to descend into the abdominal cavity, when by continued application of your nose to the funnel, should perforation exist, you will almost immediately get the aroma of escaping intestinal fluids. This, of course, will prove beyond a peradventure that perforation exists. Should you not succeed at once to obtain the scent of escaping fecal matter, gentle manipulation to various parts of the cavity will reward you with success as to whether you have a lacerated bowel with which to deal."

We are informed by the writer that what we have termed the olfactoscope has been used upon dogs, rabbits, and pigs, "with every degree of success. Likewise, upon one human being." He also tells us that there is no distress following the exploration, but leaves us in doubt as to whether the patient or the operator avoids unpleasant complications.

THE OPEN-AIR TREATMENT OF TUBERCULOSIS.

Since the meeting of the British Congress on Tuberculosis there has been a general exploiting of the necessity of open-air treatment in this disease. It bids fair to become a fad, and as such to be prescribed in an indiscriminate fashion, which will sooner or later bring a valuable means of treating tuberculosis into undeserved discredit.

A few articles have appeared which have shown an understanding of the basic principles in the treatment of this disease and in the application of the open-air method to the indications. Others manifest overweening confidence in the method, thinking all that is necessary is to turn patients into the open air to have them get well.

One is reminded of the general discussion upon the cold-bath method of treating typhoid fever. Exploited as it was as a cure-all in this disease, and from being indiscriminately employed, it is now used with some definite idea of its limitations and some individualizing of the treatment. Even with a treatment so near a specific as quinine in malarial fever, it is still necessary to prescribe it with judgment in reference to its absorption, and with a dosage based upon individual indications.

In the open-air treatment of tuberculosis it is not sufficient that a patient be turned out-of-doors to live in a tent in order to have him recover. Indeed, tent life may be even more objectionable than living within doors, as ventilation of a tent in the cold season when the openings must be closed and the interior heated with a stove may be much poorer than in the average house. Much can be done in the home open-air treatment of tuberculosis, particularly in the rural districts and smaller towns. Most houses can be provided with a balcony or other suitable shelter which admits of the details being carried out with some degree of persistence. For the town dweller, the open-air treatment to be efficiently applied must be in a sanitarium or in a camp especially prepared for tuberculosis patients. The treatment must be under medical supervision and must be individualized.

THE EDUCATION OF DEAF-MUTES.

We have repeatedly called attention in these pages to the results reached by Bezold in the improvement of the defective hearing of so-called deaf-mutes. This writer found, upon examining the pupils in the deaf and dumb institutions of Bavaria, that a very considerable proportion of them were not totally deaf, but possessed a certain aural capacity. He further demonstrated that by careful training this latent power could be so far improved as to enable them to become useful members of society. In testing the ears, both the right and left were separately examined, and the range of sound perception for each ear noted. It was found that if perception of the range of the human voice was lost, then it was useless to attempt the reëducation of the sense of hearing, as the patients were not improved. These preliminary tests save an immense amount of labor and are at once scientific and accurate. By it those who are true deaf-mutes are easily distinguished from those in whom the hearing has simply become torpid and who have failed to learn to speak because of an aural incapacity which was not irremediable. It is to be regretted that these methods have not obtained recognition in this country in the education of mutes. It was only recently that it was felt to be important to examine the ears of the children in the Illinois institutions for the deaf and dumb, and it will probably be many years yet before there will be a well recognized scientific effort to improve the condition of these unfortunates. The chief stumbling-block in such a reform is the overwhelming of the State institutions by a political tide which has largely impaired their usefulness and bids fair to continue to do so for many years to come.

ABSTRACTS.

MEDICINE.

Somatic Signs of Brain Syphilis.—PATRICK, H. T. *Journal of the American Medical Association*, Oct. 26, 1901.

Brain syphilis is most frequent in the first year after infection. It is next most frequent in the second year, and least frequent in the third, about 50 per cent of all cases occurring within three years after the primary sore. In a case of suspected cerebral syphilis, absence of a history of specific infection should have little weight, especially in women. Commonly brain syphilis means a specific arteritis, less frequently meningitis or infiltration of the cranial nerves. A gumma comparable to a brain tumor is least frequent. Paralysis from brain syphilis, excluding the cranial nerves, is commonly due to a thrombus having its origin in a syphilitic arteritis. As a consequence, paralysis of syphilitic origin is no more amenable to specific treatment than is that due to ordinary thrombosis caused by atheroma.

Syphilis is never a system disease; hence no categorical grouping of symptoms is possible, and a concise grouping of them is impracticable, because the only systematic thing in the symptomatology of brain syphilis is the utter want of system.

Lack of Type.—Brain syphilis is characterized by apparent inconsistencies, and any brain case having an unusual admixture of psychic and somatic disorder, as regards either time or localization, should awaken a suspicion of lues.

Headache.—In about 75 per cent of all cases of cerebral syphilis headache is present—often nocturnal, but it may occur in the daytime, with relief at night. It is usually severe, and its location is unimportant. In the early history the headache may be paroxysmal, and in this way simulate migraine of malarial infection; later, it tends to become continuous.

Transient Attacks.—These consist of dizziness, syncope, momentary loss of consciousness resembling *petit mal*, localized numbness or tingling, spasms varying from localized twitchings to violent convulsions; typical Jacksonian attacks may occur, and seizures are usually accompanied by some loss of power, more or less transient. Epilepsy or apoplexy between 20 and 40 should always awaken suspicion of specific disease.

Cranial Nerve Paralysis.—The cranial nerves most frequently involved are those connected with the eye. Alexander found that 72 per cent of unilateral paralyses of the third nerve were due to syphilis, and Uhtoff says that only 15 per cent of cases of cerebral syphilis are without eye symptoms. In the absence of traumatism, at least 90 per cent of all cases of ocular paralysis in adults are caused by brain syphilis, locomotor ataxia, general paralysis, and brain tumor, and of these, by far the most frequent causes are locomotor ataxia and syphilis. Of primary optic atrophies, more than 90 per cent are due to tabes, syphilis, and general paresis. Choked disk and optic neuritis are not very frequent; when present, they are positive evidence of intracranial organic disease. The visual field is far too infrequently taken, as it affords valuable diagnostic evidence of intracranial involvement. The fifth and seventh nerves are less frequently involved than those connected with the eye. Cranial nerves below the eighth are rarely involved, but they are not wholly exempt. The same irregular involvement of the cranial nerves is noted as has been previously referred to regarding the general symptoms. One nerve upon one side and a different nerve upon the other may be affected.

Spinal Symptoms.—When to the characteristic signs of cerebral disease are added symptoms of disease of the cord or its membranes, the diagnosis of cerebral syphilis is somewhat more certain.

Impending or Accompanying Thrombosis. — We should bear in mind that brain syphilis is never a disease of the brain neurones, but of the arteries, veins, and nerve sheaths. Among the earlier symptoms are headache, transient attacks of dizziness, numbness of hand, foot, face, or tongue, transient disturbance of speech, diplopia, ptosis, sudden weakness of an extremity, partial hemiplegia which disappears, and localized spasms. In the absence of appropriate treatment the disease tends to grow rapidly worse, but never uniformly.

Stupor.—A somnolent, semistuporous condition occurs more frequently in syphilitic disease than in any other disorder of the brain. In this condition the patient can be roused, and when once awake is practically rational. After being roused, the patient lapses into stupor again.

Fever.—Cerebral syphilis is an afebrile disease, but may be associated with gastrointestinal disturbances which may result in an elevation of temperature.

Vomiting.—This occurs more frequently when the posterior fossa is involved, or meningitis is present. While the vomiting is

dependent upon the cerebral disease, it may occur after the ingestion of food, and may be more frequent after certain forms of food. Cerebral vomiting is not always projectile.

Blood Examinations in Appendicitis.—DA COSTA, J. C., Jr. The *American Journal of the Medical Sciences*, vol. cxxii, No. 6, p. 645, November, 1901.

This communication is based on a study of the blood findings in 118 cases of appendicitis. He divides the cases into purulent and non-purulent. The first group includes catarrhal and interstitial inflammations, which are not attended by gangrene or abscess formation. The second group includes cases of focal suppuration, with or without gangrene and general peritoneal inflammation. Of the 118 cases which he has studied, 38 were free from suppuration and 80 were pus cases.

One of the most striking of the blood changes is anemia. In some cases this is so marked as to demand careful attention. Every case of appendicitis shows a reduction of hemoglobin, the loss being about equal in the catarrhal and suppurative forms of the disease. The reduction amounts to about one-half of the normal standard in one case in ten; in occasional cases the reduction may be as low as 40 per cent or less. Such a marked loss argues that the hemoglobin should be estimated in every case before operation, as such a diminution might seriously jeopardize the result.

The red corpuscles are not much diminished, the average loss in the 38 catarrhal cases being 16.2 per cent, and in the 80 suppurative cases 11.9 per cent. The color index, in the majority of counts, ranged from 0.70 to 0.80. A study of the leucocytes is the most important part of the blood examination. In the catarrhal and interstitial forms, without abscess, the number of leucocytes does not exceed the maximum normal standard—10,000 per cubic millimeter. The exceptions to this rule, however, are quite numerous, for counts of 12,000 to 15,000 may be found in the catarrhal cases. The maximum count of 17,000 in catarrhal cases is somewhat lower than the average count in the pus cases. In cases with abscess, gangrene, or general peritonitis, a well marked leucocytosis is found in most instances, the majority of appendicular abscesses raising the count to 15,000 or 20,000. In cases in which the abscess is walled off so that little or no absorption of toxic material occurs, such a decided increase may not develop. An increase may not be noted in cases of profound sepsis in which the body powers are overwhelmed and reaction does not take place. The latter condition is rare in the writer's experience. The leucocytosis, if correlated with other

clinical symptoms, may serve as a diagnostic sign of definite value. A patient unmistakably septic, with a low leucocyte count, is almost invariably laboring under an intense infection, the prognosis of which is grave. A high leucocyte count in such a case is not necessarily an unfavorable indication, but simply represents an intense infection coupled with normal resisting powers. Absence of leucocytosis in a patient with mild, indefinite symptoms is a clinical sign of no tangible value in detecting the presence of pus, since a large abscess, if circumscribed, may not be accompanied by an increase in leucocytes. The leucocyte count in cases treated surgically furnishes valuable data of the progress of the case, the advent of complications or failure to secure drainage being accompanied by a rise in the number. The blood count is of little value in the differential diagnosis of conditions that may be confounded with appendicitis.

Investigation of a Localized Epidemic of Diphtheria.—Leighton, M. O. *Pediatrics*, vol. xii, No. 10, p. 360, Nov. 15, 1901.

Some Clinical Aspects of the Epidemic.—Newton, R. C. *Ibidem.*

Montclair, New Jersey, a town of 1400 inhabitants, in a healthful situation, developed between March 16 and 23 twenty-one cases of diphtheria. All were in well-to-do families. None of the patients were younger than six years, and nearly half of those affected were adults. There were no common social or religious interests among these families, nor did the various children associate in school. Food was supplied from different markets, but there was a common milk supply. Every family purchased milk from one dairy, and in no case did these families purchase from any other. The dairy was visited and cultures were made from the throats of fifty of the dairy hands. All the throats appeared fairly normal, except two, one of which showed slight inflammation, and the other had an exudate over both tonsils and the pharynx. Cultures showed what was to all appearances the diphtheria bacillus in these two cases. The dairy was closed, and within two days no further cases developed. The men employed in the dairy were quarantined, and for three weeks cultures were made from the throats of the entire number nearly every day. During these three weeks the bacillus spread from the first two to seventeen others. During the entire period not one of these individuals was sick, nor were there any clinical symptoms beyond those described in the first two cases.

The manner in which the infection reached the milkmen seems clear. The board of health requires that empty milk bottles shall

not be taken away from a quarantined house until after the case is discharged, and then it shall be done in a separate wagon and the bottles sterilized. During the winter these bottles are allowed to accumulate, and in the spring the sterilization is completed. About one week previous to the first case in Montclair, two men from the dairy were sent down to a small shanty to boil the winter stock of infected bottles. These were the two men who showed the presence of the Klebs-Loeffler bacillus when the first cultures were made.

It is apparent that a direct relation is established between the occurrence of the epidemic and the appearance of diphtheria among the dairy hands. A few individual cases are cited in support of this contention. In families closely associated, milk drinkers alone were affected. The most remarkable thing in reference to the epidemic was the escape of small children. The epidemic, as a whole, was mild, but antitoxin in early and large doses was given in all cases at the dairy, and in most of the private cases. Two deaths occurred among the forty-nine reported cases, the total including cases in adjoining towns supplied with milk from the infected dairy.

Clinical Observations on Blood-pressure.—CARTER, H. S. The *American Journal of the Medical Sciences*, vol. cxxii, No. 7, p. 854, December, 1901.

In this clinical contribution the sphygmometer of Hill & Barnard was used. It consists of a rubber bag fastened about the arm, just above the elbow. Air is then forced into the bag, which is interposed between the rigid frame of the armlet and the skin. When the pressure is sufficient to move the needle connected with the registering apparatus, there is a continuous column of air between the bag and the registering mechanism. The pulse wave is communicated from the artery to the needle, which oscillates, the greatest excursion of the needle representing the mean arterial pressure. The class of cases in which information in regard to increased blood-pressure is of most value is that of nephritis, with or without arteriosclerosis, and those cases in which arterial pressure is below normal. The number of cases of all descriptions whose blood-pressure was investigated was 129. The mean arterial pressure in young men is from 110 to 120 millimeters of mercury while standing, and 100 to 110 in the recumbent position.

In all, sixteen cases of acute nephritis were examined. In no case of secondary parenchymatous nephritis complicating an acute infectious disease was the pressure over 100 millimeters, and it was usually much below this. As a rule the greater the amount of albu-

min present the higher the arterial pressure, though this was subject to some notable exceptions. The average mean arterial pressure in chronic nephritis is about 62 millimeters higher than that of acute nephritis. In none of the cases studied was there a chronic nephritis without an accompanying arteriosclerosis.

The most satisfactory drug for lowering blood-pressure, whether the increase is due to nephritis or marked arteriosclerosis, is sodium nitrite. The dose should be from two to three grains, at intervals of from two to four hours. It causes a reduction of ten to fifteen millimeters, the reduction persisting for about an hour and a half. The most rapid means of reducing blood-pressure is phlebotomy, with an extraction of from five to eight ounces of blood, followed by a saline infusion, associated with sodium nitrite in full doses. The blood-pressure in aortic regurgitation, whether accompanied by nephritis or not, is low; if mitral regurgitation is present, it may be nearly normal. Blood-pressure in all forms of anemia is below normal.

Experimental Yellow Fever.—GUITERAS, JOHN. *American Medicine*, vol. ii, No. 21, p. 809, Nov. 23, 1901.

The favorable results obtained by the United States Army Commission, and the number of mild cases which followed the experimental inoculations, led the writer to make some observations upon the possibility of immunizing those who from necessity must live in a climate where yellow fever is rife. There was no experimental reason for thinking that artificially inoculated yellow fever would be mild, but it was hoped that limiting the number of bites and the early and prompt treatment of the disease might reduce the mortality to infinitesimal proportions, if not to the vanishing point. Accordingly, an inoculation station was established in which mosquitoes were cultivated and then allowed to bite patients suffering from yellow fever. In all forty-two inoculations were made, of which thirty-four failed and eight were successful. So far as the small number of experiments go, it appears that an insect to cause the infection must bite the yellow fever patient within the first three days of the development of the disease. A mosquito so infected cannot transmit the disease until a period of twelve days or more has passed, and a somewhat longer period of inoculation gives more certainty in the results. A number of failures are attributed to the fact that the mosquitoes were allowed to bite patients that were doubtfully ill with yellow fever.

This experimental work shows that immunizing on a large scale

cannot be attained with present methods without considerable risk. The mortality from experimental inoculation is much less than where the disease is acquired in the usual way.

Nearly complete control over the spread of yellow fever has obtained in Cuba during the past year. The prophylactic measures that have secured this result are based upon the doctrine of transmission of yellow fever by the mosquito. A few sporadic cases have occurred which have been imported from the interior, but in every instance the propagation of the disease has been arrested. These results have been obtained by the systematic destruction of mosquitoes in every house where a case of yellow fever presented itself. On September 13 there was but one case of yellow fever in the city of Havana, while in former times this period of the year commonly sees the epidemic at its height.

Osteitis Deformans.—PACKARD, F. A.; STEELE, J. D.; and KIRKBRIDE, E. S., Jr. The *American Journal of the Medical Sciences*, vol. cxxii, No. 6, p. 552, November, 1901.

A case of this rare disease is reported in which an autopsy was obtained and a careful macroscopical and microscopical study of the bones was made. In all, sixty-seven true cases of osteitis deformans have been reported. It is a distinct disease of obscure etiology, closely related to osteomalacia, fragilitas ossium, and acromegaly. The disease is most frequent in late adult life, but its onset has been noted as early as the 21st year. It shows a predilection for the male sex, and in some cases trauma is a factor in its production. A few cases have been reported in which families show a striking tendency to the disease.

The symptoms in different cases bear a striking resemblance to each other in their general characteristics; the most noteworthy points are enlargement and projection of the forehead, dorsocervical kyphosis, prominence of the clavicles, spreading of the bones of the thorax, diamond-shaped abdomen crossed by a deep sulcus, relative increase in the width of the hips, and outward and forward bowing of the legs. The bones most frequently involved are those of the cranium, the tibiæ, and the femora.

There is absorption of the compact substance of the bone causing enlargement and confluence of the Haversian canals. New bone is found diffusely in the affected and healthy portions, which remains uncalcified and is in turn absorbed. The medullary substance is converted into a vascular connective tissue, containing fat and giant cells and leucocytes. In some cases cysts are found filled with gela-

tinous material. As a consequence of these histological changes the ordinary relations of the compact substance and medulla are destroyed. The bones are thickened and unsymmetrical. The diminished calcification of the long bones allows them to bend.

The pathological aspect of osteitis deformans is so characteristic that it is to be regarded as a distinct disease. Its etiology is as obscure as it was when Paget first described the condition.

The Bacteriology of Otitis Media.—FUNKE, JOHN. *American Medicine*, vol. ii, No. 20, p. 773, Nov. 16, 1901.

The author bases his conclusions upon a laboratory study of seventy-six cases and a summary of the recorded observations. There is no specific organism in this disease. In individual cases there is commonly a germ that excites the inflammation, but it is accompanied by other bacteria which often influence the outcome of the case. The organisms found in the order of their frequency are the pneumococcus, streptococcus, staphylococcus albus and aureus, and the bacillus of Friedlander. It is probable that otitis sometimes results from the influenza bacillus, but the latter commonly yields to other germs. The diphtheria bacillus is more commonly present than is usually believed; it may be the initial infecting agent, or it may enter with the streptococcus or staphylococcus, or may be a secondary infection. The streptococcal infections are more severe, and persist longer than the pneumococcal, but both are usually supplanted by the staphylococcus sooner or later.

Chronic suppurative otitis media is always a sequence of the acute, and, like it, possesses no specific organism, being always polymicrobic. The fetor in these cases is to be attributed to the pyogenes fetidus. It is probable that there is a primary tubercular otitis, but the demonstration of the bacillus in the discharges is too difficult and uncertain to be of clinical value. Better results may be reached by the examination of small pieces of tissue removed by the curette.

Typhoid Cystitis.—YOUNG, H. H. *Maryland Medical Journal*, vol. xliv, No. 11, p. 456, November, 1901.

This case of typhoid infection of the bladder lasted eight years, dating from an attack of typhoid fever in 1893. Since that year the urine has been purulent. In 1898 the urine contained pus cells and small, thin bacilli which decolorized by Gram. A culture made after thorough cleansing of the urethra showed a pure growth of this bacillus. The same organism was found in a culture obtained

from a specimen of urine drawn by suprapubic aspiration. The cultural and serum reactions showed that the bacillus in question was identical with the bacillus typhosus. The patient was in the hospital eighteen days, during which urinations were about normal in frequency and there was no bladder irritation. In 1899 there was an attack of gonorrhea, from which the patient never recovered. At this time the urine showed a dark-gray turbidity, with soft cheesy masses which sunk at once to the bottom of the vessel. The specific gravity was 1014 and a slightly acid reaction. There was a small quantity of albumin. Cultures made on numerous occasions showed a pure growth of the bacillus typhosus.

A cystoscopic examination showed the mucosa reddened and numerous small ulcers. The diagnosis was a general chronic ulcerative cystitis. An interesting observation is that after the cystoscopic examination there was an exacerbation of the gonorrhea, followed by an invasion of the bladder with the gonococcus. At first there were only a few diplococci in the urine, but they finally appeared in great numbers, despite the constant administration of urotropin and bichloride irrigations of the bladder. Both the gonococcus and the typhoid bacillus persisted in about equal numbers, and four months after the patient left the hospital they were still present and the urine was unchanged.

SURGERY.

Indications for Gastroenterostomy.—MAYO, W. J. *St. Paul Medical Journal*, vol. iii, No. 11, p. 737, November, 1901.

This operation is far more valuable than any other surgical procedure upon the stomach. It is especially indicated in those cases of cancer with pyloric obstruction which cannot be removed. It possibly has an extensive range in ulcer and inflammations of the stomach. Of 136 operations on the stomach which have been performed by the writer and C. H. Mayo, more than one-half have been gastroenterostomies.

Nearly one-half of the cases of malignant disease of the stomach were so far advanced at the time they came under observation that even an exploration would be of no service. The most elaborate examinations of the stomach contents fail to reveal malignant disease in its incipiency; where the disease is located in the pylorus and causes obstruction, early symptoms are present. The compensatory hypertrophy which is so marked in other disorders of the stomach is strikingly absent in malignant disease.

In fifty-three operated cases of cancer of the stomach, gastroenterostomy was performed eighteen times, with four deaths. The longest period which a patient lived after the operation was nineteen months. Excision of the pylorus, and more or less of the stomach, was undertaken eleven times, with one death. Six of these patients are still alive, one nearly four years after the operation.

Exploratory abdominal incisions are closed with permanent suture of buried silk or silver wire. This enables the patient to get about the next day, and leave the hospital within the week. If left in bed the usual length of time, many of these patients become progressively weaker and are unable to return to their homes and friends. The mortality of gastroenterostomy for malignant disease is 20 per cent or over, fully as high as after pylorectomy. The first requirement for the performance of a radical operation is that the disease must not be too far advanced and the patient must be in a good condition. In gastroenterostomy no such limitations are imposed, and its mortality is influenced to a large extent by the condition of the patient. In ulcer of the stomach, gastroenterostomy is the most useful operation, in the majority of cases. It relieves the hyperacidity, permits of a prompt passage of the food into the intestine, thus preventing irritation of the ulcer, and gives the patient an improved nutrition.

In acute ulcer the stomach is commonly contracted and will remain so unless the ulcer is in the vicinity of the outlet. The pyloric ulcer gives the greatest amount of trouble after it has begun to heal; it is often extensive, and in chronic cases only partly cicatrized. Such may often narrow the pylorus so as to cause obstruction. In such cases symptoms of open ulcer alternate with periods of health, and later ulcer associated with dilatation is found.

From an operative standpoint, ulcers may be divided into two groups: those in which the pyloric region is involved, in which there is a normal or enlarged stomach; and secondly, ulcers in other parts of the stomach in which the organ is contracted. In the first group, gastroenterostomy is the operation of choice; it delivers the ingesta at a point away from the healing process, allowing it to go on rapidly. Of eleven operations, ten were cured and one died. Gastroenterostomy on the small stomach, affected by ulcer, does not give immediate relief. In four of the writer's cases the symptoms were modified, but continued for some months.

Of sixty-seven gastroenterostomies, there was a mortality of less than 9 per cent. The highest mortality was in malignant cases, and

reached 23 per cent. The mortality where the operation was undertaken for ulcer was 6 per cent. In the thirty-five times in which it was performed for benign obstruction of the pylorus, there was only one death.

Of the operation itself, it may or may not be performed with the Murphy button, this being a matter of individual preference, the results being about the same. It is a matter of indifference whether the anastomosis be made with the anterior or posterior wall; fifty-seven of the writer's cases were with the former and ten with the latter. The anastomosis should always be made near the greater curvature and at the bottom of the stomach pouch. As a rule, it is not necessary at the time of primary operation to unite the two limbs of the bowel, particularly if a low union of the stomach is secured. Adhesions or angulations caused abnormal distress in four of the cases.

Permanency of Cure in Operations for Hernia.—OCHSNER, A. J. *American Medicine*, vol. ii, No. 22, p. 853, Nov. 30, 1901.

The question of mortality in the radical treatment of hernia has been disposed of by the brilliant statistics of Coley, Bull, and others. Permanency of the cure after operation depends upon a small number of simple features. These are:

The wound must heal primarily. There must be immediate union without suppuration scars, and the least possible amount of cicatricial tissue.

The stitches should not be drawn tightly. This avoids pressure necrosis, which is liable to occur from the edema following an operation. It is possible that there is always a certain amount of pressure necrosis whenever a suture is used, but it is reduced to the smallest proportions by drawing the stitches just tight enough to place the tissues in apposition without causing pressure. A small amount of necrotic tissue will furnish a good culture medium and thus prevent primary union.

The edges of the surface to be united must be free from fat and other unstable tissues. No matter how perfect a union may be, if the attachment is to a tissue which has little resistance, the union is of no value. It is necessary to carefully dissect away the soft muscular or connective tissue, as well as masses of fat. For the same reason, blood-clots must not be allowed to interpose between the surfaces to be united.

The tissues should be manipulated with the greatest care during operation. The utmost care must be exercised to avoid rough

handling. The less the tissues are disturbed, the better the primary union.

The wound should be supported by broad rubber adhesive plaster strips. This secures as perfect rest as is possible for the tissues, and favors a minimum of cicatricial tissue.

The patient should be kept in bed for two or three weeks. On this point there is a wide difference of opinion, but it seems reasonable to suppose that if an opportunity is given for the wound to become firm, there will be less likelihood of its giving way.

Abnormal intra-abdominal pressure should be eliminated. Constipation, strictures of the urethra, and enlargement of the prostate, as well as obesity, all favor increased abdominal pressure and should be eliminated by appropriate treatment.

Natural Method of Draining the Peritoneal Cavity. — CLARK, JOHN G. *University of Pennsylvania Medical Bulletin*, vol. xiv, No. 9, p. 333, November, 1901.

In 1896 the writer suggested and began using the postural method of draining the peritoneal cavity. This consisted of introducing a liter of salt solution at the completion of an abdominal operation, and then elevating the foot of the bed for twenty-four hours. It is no longer thought necessary to elevate the feet, as absorption seems to be quite as rapid in the prone position. Aside from drainage, the introduction of normal salt solution into the abdominal cavity favors the movements of the intestines, and by being floated upward they are assisted in regaining their normal position. Since using peritoneal infusions, the writer has had no case of postoperative obstruction. The routine use of normal saline solution in the peritoneal cavity is free from danger, and is of great value in preventing general or local peritonitis. It prevents shock from loss of blood, and is one of the best general stimulants. Frequently when the pulse is 160 and weak, at the close of an operation, it will be found that within a few hours afterward the pulse has fallen to 120 and has become full and regular. Another marked advantage is the prevention of thirst and the stimulation of the urinary excretion. The effect upon the kidneys is the same, whether the infusion is made directly into the abdomen or a high saline enema is given. The average increase in the excretion of the kidneys in twenty-four hours, in those who receive salt solution, amounts to about 150 cubic centimeters. This dilution of the urinary excretion lessens vesical irritation, and catheterization after operation is much less frequently needed. The increased elimina-

tion tends toward the lessening of infection. The researches of Flexner have shown that patients with moderate impairment of kidney function succumb to infections that are well borne by others who have a normal power of elimination. After saline infusions, patients may complain of distress over the diaphragm. This is obviated by the application of a two-inch strip of adhesive plaster around the base of the chest. This pain is attributed to an increase in the functional activity of the absorbing areas of the diaphragm; in no instance could it be attributed to peritonitis or pleurisy.

The Surgery of Complications Following Pneumonia. — EISENDRATH, D. N. *Philadelphia Medical Journal*, vol. viii, No. 19, p. 786, Nov. 9, 1901.

In discussing pulmonary abscess and bronchiectasis, he divides the complications into acute simple abscess, chronic simple abscess with or without bronchiectasis, acute gangrenous abscess, chronic putrid abscess with bronchiectasis.

In making a diagnosis the history is of the greatest importance, as in many cases the physical signs are atypical. The most reliable sign is the presence of râles, frequently metallic in character. A striking feature is the variability of the physical signs; at one time dulness, and again tympany at the same spot. The general remittent character of the symptoms and the profound failure of the general health point to one of these complications, particularly where a pneumonia has preceded the chronic failure of health. The sputum furnishes valuable aid in the differential diagnosis. In abscess it is purulent, at times of a chocolate color, and occasionally contains elastic fibers. In gangrene it is offensive, becoming more so as the disease advances, and separates on standing into three layers. In bronchiectasis the sputum is at first odorless, but may become foul. The amount of expectoration in dilated bronchus is large, while that from abscess is usually small. It is easier to arrive at a correct opinion of the nature of the process than to localize it. If a lesion does not communicate with the bronchus, it may give rise to no physical signs, and the latter, when present, may often be misleading. It is almost impossible to differentiate an encapsulated empyema from an intrapulmonary focus.

Of ninety-three recorded cases of abscess following pneumonia, the mortality was one out of twenty-five in cases of acute simple abscess. Of twenty-eight cases of acute gangrene, six died. Of fourteen cases with chronic simple abscess with bronchiectasis, six recovered, three improved, five died. Of twenty-six cases of chronic

putrid abscess with bronchiectasis, thirteen recovered, four improved, and nine died. There is a marked improvement in the recovery rate in the last five years. Much depends upon early surgical intervention, before the strength of the patient is exhausted or the walls of the abscess have become rigid, so that when opened it does not drain readily.

A Tumor of the Optic Nerve Removed by Kronlein's Operation.—Pockley, F. A. The *Australasian Medical Gazette*, vol. xx, No. 10, p. 411, Oct. 21, 1901.

A healthy, robust lad, aged 13, had for the last six or eight months noticed an increasing prominence of the left eye, with later impairment of vision. There had never been pain or inflammation. On examination, the left eye was found to be pushed forward to the extent of three-eighths of an inch, but its movements were free in all directions. A diagnosis of retro-ocular tumor, situated within the muscles and probably springing from the optic nerve, but not involving it, was made.

A curved incision was made down to the periosteum, beginning at the anterior boundary of the temporal fossa about one-half inch above the orbital margin and terminating over the zygoma, midway between the external canthus and the tragus, the convexity of the curve being downward and forward. The periosteum was then incised and the bone cut through in three directions, partly with a chisel and mallet, aided by a small circular saw attached to a dental engine. The first section divided horizontally the external angular process of the frontal bone; the second ran obliquely downward and backward from the bottom of the first bone incision and terminated in the sphenomaxillary fissure; the third divided horizontally the frontal process of the malar bone and was continued backward into the sphenomaxillary fissure. The incisions are made in the above order, and by them a triangular piece of bone is separated, measuring about one and a quarter inches vertically, and one inch anteroposteriorly. This wedge of bone with its overlying soft tissues is held outward and backward, leaving a space through which the contents of the orbit are easily reached.

In this case a tumor was found attached to the optic nerve, having a diameter of about three-quarters of an inch. Without much difficulty it was freed from the sheath of the nerve and removed. The wound healed by first intention. In a few days the eye had receded to its normal position in the socket. An accompanying optic neuritis rapidly subsided after the operation.

Results in One Thousand Cases of Nitrous Oxide and Ether Narcoses. —CARTER, H. W. *Medical Record*, vol. lx, No. 19, p. 732, Nov. 9, 1901.

Nitrous oxide is the safest general anesthetic. Its only danger is from asphyxia, and this can be avoided by mixing the gas with atmospheric air and with oxygen. The first sign of impending suffocation should be a warning for the admission of more air, and it is surprising how easily some patients can be anesthetized, even when it is very much diluted. The main advantages of nitrous oxide as a preliminary to ether are its safety and its rapid and pleasant action. The principal disadvantages with ether are its disagreeable, pungent odor and its irritating effect upon the respiratory mucous membrane, as well as the slowness with which anesthesia supervenes. In using the two in combination or succession, the pleasant and rapid action of the nitrous oxide replaces the unpleasant sensation of the first stage of ether inhalation. Full surgical narcosis is reached with small quantities of the two agents, and the saturation of the blood and tissues is avoided.

Chloroform is admittedly more daugerous than ether, but it has been administered in cases where there are renal and pulmonary complications, as it is believed to be less irritating to these structures. It is, however, largely a question of quantity. If the ether can be kept somewhere near the amount of chloroform necessary for such anesthesia, it is less irritating than the latter, and this can be accomplished by the simultaneous administration of nitrous oxide. The number of patients who cannot take nitrous oxide gas and ether is very small. Even those addicted to alcoholics and narcotics, who are difficult to anesthetize, are readily brought under the influence of the mixture. In some cases where chloroform is indicated, it may be well to begin the anesthesia with a mixture of nitrous oxide and ether, and then maintain the anesthetic with chloroform. In such a method the initial stimulating effect of the ether enables the chloroform narcosis to proceed with greater safety.

Ultimate Results of Tendon Grafting in Paralysis.—WHITE, SINCLAIR. *Pediatrics*, vol. xii, No. 9, p. 345, Nov. 1, 1901.

This writer gives an account of his personal experience in eleven operated cases of tendon grafting for paralysis. It is nearly twenty years since this operation was first proposed, but it is only of late that it has been frequently employed, and comparatively few reports are at hand giving ultimate results. Of his cases only one concerned the extensor muscles of the thumb, and the others were foot palsies in which the anterior tibial and perineal muscles were

involved. The deformity varied more in degree than in character, the prevailing feature being a talipes equinus with more or less inversion of the sole, but in two cases it was a pure equinus. In all the foot cases the tendo Achillis was lengthened, and a slip from the outer side of its tendon was transferred to the front of the ankle; in two cases this represented the entire operation. The next most frequent procedure was to detach the tibialis posticus from its insertion into the scaphoid bone and bring it in front of the internal malleolus, where it was anchored to the tendon of the extensor proprius pollicis and to that of the long extensor of the toes. In the case of thumb palsy in which the tendon of the flexor carpi radialis was transferred to the paralyzed extensor tendon, an appreciable but not a marked improvement was noted. Of the ten foot cases, but seven are available for estimating the ultimate results. Six of these were greatly benefited by the operation; in three it is difficult to detect any defect in the gait. In three others the deformity, while not entirely removed, is greatly reduced. In each of these the ankle-joint can be flexed, but not to the full extent. The lessening of toe-drop in all cases improves the power of locomotion. The seventh case, that of a four-year-old child, was a failure, as an elastic band is needed to prevent the foot from falling inward.

Silver Wire in the Treatment of Aortic Aneurism.—FREEMAN, L. The *American Journal of the Medical Sciences*, vol. cxxii, No. 7, p. 743, December, 1901.

Wiring of aneurism is an operation which is confined to dilatation of the large blood-vessels, which cannot be reached by the usual surgical means; they include enlargements of the abdominal and thoracic aortas and innominate artery. In this treatment certain conditions must obtain; the aneurism should be sacculated, and the opening into it should not be too large, and it should have but one compartment; it must not have progressed too far toward rupture, and the patient should have sufficient vitality to survive the tedious cure. Fourteen cases have been reported in which wire alone was used, and twenty-three in which both wire and galvanism were employed. There were seven recoveries, not a brilliant showing; but when the inevitably fatal consequences of the condition are considered, it is better than that made by any other procedure. The wire should be of silver, and about No. 27. Such a wire disintegrates more rapidly under the action of the electric current, its surface becomes roughened, and hence it furnishes a better support to the clot. It coils evenly in the cavity of the aneurism, giving a

well distributed mesh. If the cannula is inserted into the sac too deeply, the wire has a tendency to coil against the further wall. The length of wire to be employed is still a matter upon which a definite opinion cannot be given; the amount used in different cases varied from 20 to 225 feet. The strength of current employed was from 10 to 100 milliamperes. It is probable that the stronger current is the best, as there is little danger of injuring the walls of an aneurism by an electric current.

The Bottini Operation.—HORWITZ, O. *Philadelphia Medical Journal*, vol. viii, No. 22, p. 958, Nov. 30, 1901.

A collection from the literature of 888 operations on the treatment of obstructive hypertrophy of the prostrate gland by the Bottini operation shows a mortality of 5.7 per cent. In eighty-eight cases no benefit was derived from the operation. The remaining cases, amounting to 84.3 per cent of the entire number, were improved or cured.

The advantages claimed for the operation are that patients submit to it with less reluctance than they do to other methods of surgical intervention; the time required in performing the operation is short, and the loss of blood is, as a rule, trifling; hence, the operation is followed by little shock and by rapid convalescence. A want of success with the operation is due to the pathological changes and complications which have taken place. The method is contraindicated when a valve-like formation exists, or where there is a greatly increased overgrowth of the three lobes, associated with tumor formation, giving rise to a pouch above and below the neck of the bladder. Pyelitis when present adds greatly to the danger of the operation, but is not always a contraindication. The character of the growth has but little bearing on the result. In suitable cases it is the best radical measure for the relief of prostatic hypertrophy, being attended by the least mortality. The operation is especially indicated in the beginning of obstructive symptoms, due to hypertrophy of the prostrate gland, and it may be regarded as a prophylactic method of treatment.

Torsion of the Spermatic Cord.—ATHERTON, A. B. *Medical Record*, vol. lx, No. 21, p. 816, Nov. 23, 1901.

It is only in recent years that torsion of the spermatic cord has been referred to. The patient who was operated upon was supposed at the time the physician was sent for to be suffering from strangulated hernia. The history showed that the boy had been as

well as usual until the morning of the day he came under observation, when some pain and swelling was felt in the left groin. This continued during the day, and in the evening chloroform was administered and an attempt made to reduce what was thought to be a hernia.

Upon examination there was found a lump in the left groin, being continuous with the upper portion of the testicle and extending two inches above the external inguinal ring. The swelling was about one and a half inches in diameter and soft and tender to the touch. No impulse was noted on coughing, and dulness was elicited on percussion.

An oblique incision one and a half inches long was made, and a thin, dark sac was reached, which on being opened gave exit to some serous fluid. In the wound was found the congested epididymis, which was continuous with the cord above and the testicle below. The cord was twisted twice on itself. The vessels of the cord were thrombotic; the testicle presented a dark, mottled appearance. The cord was ligated and divided, the epididymis and testicle being removed.

THERAPEUTICS.

The Treatment of Venereal Diseases in Dispensary Practice. — CHRISTIAN, H. M. The *Therapeutic Gazette*, vol. xxv, No. 11, p. 726, Nov. 15, 1901.

The writer gives a brief statistical study of the venereal diseases taken from the case-books of the genito-urinary dispensary of the University Hospital of Pennsylvania. In all, these include a study of 6587 cases of genito-urinary disorders. Of this number 4890 belong to the class of venereal diseases, of which there were: gonorrhea, 1240; chronic anterior urethritis, 449; chronic posterior urethritis, 253; stricture, 420; chancroid, 452; chancre, 440; secondary syphilis, 479; tertiary syphilis, 157.

Gonorrhea is more scientifically treated than formerly, the patients being thereby saved considerable discomfort. The shortening of the disease, the aim of most of the newer methods of treatment, has not been accomplished. An investigation of the case-books shows that in the majority of instances gonorrhea in dispensary practice is quite as protracted now as it was ten years ago.

In the treatment of gonorrhea, about all the newer methods of the last ten years have been tried in the dispensary, but it has finally settled down to the following simple plan: During the first ten

days or two weeks the patient is given two solutions for injection. The first is composed of permanganate of potassium, one-half grain to eight ounces of water. With this the patient is directed to flush the urethra with an ordinary hand syringe, which is filled six times, the procedure to be employed thrice daily. This is followed by a solution of protargol, ten grains to four ounces, which is injected into the urethra and retained for ten minutes. At the end of four days the permanganate is increased to a strength of 1-to-4000, and the protargol to 20 grains to 4 ounces. After the second and third week, a favorite prescription is:

℞ Zinc sulphate..... 10 grains.
Bismuth subcarbonate..... 2 grammes.
Solution of hydrastis (colorless)..... ½ ounce.
Water to make..... 4 ounces.

At the same time copaiba and oil of sandalwood are always given. Under this routine treatment the majority of acute cases get well in from six to seven weeks.

In cases of chronic urethritis where the disease depends upon stricture or granular patches, sounds are passed three times a week, followed by an irrigation of silver nitrate, beginning with a solution of 1-to-8000, which is gradually increased to 1-to-1000. In cases of chronic folliculitis involving the glands along the urethra, a sound is introduced, covered with an ointment containing iodine and iodide of potassium. Chronic posterior urethritis is treated by massage of the prostate and irrigations of the urethra, with deep instillations of protargol. Three-per-cent sulphate of copper and one- and two-per-cent nitrate of silver are of value in chronic disorders of the deep urethra.

Chancroids, where there is no question as to the diagnosis, are cauterized with nitric acid. The patient uses a dusting powder of iodoform two parts and acetanilid one part. As a substitute for iodoform, bismuth formic iodide powder has been used. Powdered chloretone is useful where there is pain.

The initial lesion of syphilis is kept clean, and as free from irritation as possible. It is washed with a 50-per-cent solution of peroxide of hydrogen twice daily, followed by a dusting powder of acetanilid and iodine in equal parts. No constitutional treatment is instituted until secondary acute manifestations occur.

Constitutional syphilis is divided for treatment into two classes, the benign cases and the more severe form. To the former is given protoiodide, one-third grain in pill form, three to four times a day. This treatment is continued for eighteen months. In the more

severe cases increasing doses are given, until the gums are inflamed, or there is decided fetor of the breath. The number of pills requisite to bring about this condition is divided by two, the result being the dose which is to be administered to that patient. When mercury by the mouth is not assimilated, inunctions of mercury are employed. In tertiary syphilis, mercury is always employed in conjunction with potassium iodide.

Treatment of Hemiplegia.—GUTHRIE, L. G. *The Lancet*, Oct. 19, 1901.

In many instances hemiplegia is not treated at all, or if so, only with iodide of potassium and strychnine. This is due to the too prevalent view that paralysis is a condition which is permanent. In severe cases of hemiplegia, the patient's arm and leg are quite useless, the joints become fixed in whatever abnormal position they are allowed to rest, the muscles waste and shorten. The methods at our disposal for overcoming these conditions are passive movements, massage, and electricity, reëducation of movements by passive and active exercises, and mechanical therapeutics. Neglect and want of treatment aggravate severe and retard the recovery of mild cases.

Articular adhesions are most common in the shoulder, though any joint may be affected. A limb which might have recovered is often useless, owing to their presence. Some regard the adhesions as atrophic, others as rheumatic, and in some cases it is difficult to distinguish between such adhesions and ordinary rheumatoid arthritis. Whatever the cause, in most cases the adhesions may be prevented. The fear that movement of the limbs will predispose to another hemorrhage is unwarranted. The passive movements should begin early, as the adhesions form very soon after the stroke.

Spasticity, or early rigidity, which leads to structural shortening of the muscles, is practically incurable, when it is once established. The early treatment of this condition is as important as that for the articular adhesions. Faulty positions, even while the patient is confined to the bed, should be corrected. Adduction of the shoulder may be prevented by placing a sand-bag in the axilla; the elbow should be kept extended. The leg should be rotated outward and abducted, and the foot flexed on the dorsum and everted. Contraction of the hamstrings should be remedied by raising the heel. Sand-bags may be used to insure a favorable position of the legs. When the patient leaves the bed similar precautions should be taken against malposition. He should never be allowed to carry the arm in a sling or sit with the knees and toes drawn in.

Muscular atrophy occurs sooner or later in hemiplegia, and is mostly due to disuse. It is probable that when a cerebral lesion is healed recovery from hemiplegia may not take place, owing to the functional affection of the lower neurons, produced by disuse of the limbs. This wasting is due to the absence of normal stimuli, and something must be devised to take their place. These include passive movements, massage, and electricity. With these aids are often preserved the nutrition of the muscles and the peripheral neurons.

As regards reëducation of movements recovery is not to be looked for, but it is well to remember that organic lesions always appear to be more extensive than they are. Even in the worst cases a certain amount of improvement may be expected. Spasticity and wasting is an index of the gravity of the condition, being much more significant than motor paralysis. Patients should be told the order in which the movements return, and it is frequently a great encouragement for them to observe the gradual restoration of power in the leg, while the arm is still useless. It is this principle that is applied in reëducation, which leads to a gradual amplification of movement. Weights, pulleys, and elastics are of some value, but only in strengthening muscles which have already regained a certain amount of power.

Treatment of Migraine.—THOMSON, W. J. *Medical Record*, vol. lx, No. 20, p. 761, Nov. 16, 1901.

The writer leans to the view that migraine in the majority of instances is of toxic origin. He rejects the theory that it is a degenerative neurosis. The largest number of cases are among brain-workers and those following sedentary occupations. Sailors, truckmen, and others who lead an outdoor life associated with muscular exertion, are almost exempt. From this he argues that in migraine there is usually a passive congestion in the portal circulation. This leads to fermentation in the intestine and absorption of toxic products, with the development of the explosive headaches. The marked hereditary element in these cases is explained by the theory that all disorders of the alimentary tract have a tendency to pass from parents to offspring.

With these views of the origin of migraine the writer readily arrives at a method of treatment which aims at restoring the general tone of the nervous system, developing the muscles, improving the circulation in the abdomen, and so far as drugs are concerned, administering intestinal antiseptics with cathartics. In prophylaxis all cases should

be regarded, without exception, as chronic dyspepsia, one of the commonest symptoms of which is constipation. A mercurial laxative should be given at least every week. This should consist of a five-grain blue pill at night, followed by a saline in the morning. In addition, one to two drachms of sulphate of soda, with ten grains of sodium salicylate, is to be given in a tumbler of hot water, sipped every morning on arising. Half an hour before each meal a pill is taken containing one-twentieth of a grain of bichromate of potassium, with three grains of bismuth subcarbonate half an hour after meals. At night a full dose of an intestinal antiseptic, ten grains of phenol bismuth or ten grains of ammonium benzoate or sodium benzoate, is given in two capsules. Sometimes when the intestinal derangement takes the form of diarrhea, the above prescription is quite as useful as in those cases in which there is constipation.

Treatment of Cutaneous Epitheliomata.—Allen, Charles W. The *New York Medical Journal*, Nov. 9, 1901.

A reiterated dictum holds that the knife is the only treatment for cancer. This is unquestionably true where the incisions can be made through the healthy tissue and all the diseased parts removed. In superficial cancers the Roentgen rays are useful, and they will probably receive extended application in the near future, though it is difficult to limit their action and unpleasant complications may ensue. The Finsen light method also has marked limitations. After allowing the first place to surgery in these newer methods, there still remains a considerable proportion of cases in which patients will not submit to the knife, or in which it cannot be used and the newer methods cannot be adapted to the case. These cases can often be treated by caustics or electrolysis, or by the two in combination.

In the ordinary form of epithelioma of the face in which the tendency is to spread horizontally, and to avoid the deeper tissues and lymph channels, it is well to begin by curetting the edge with a sharp spoon. This curettement prepares the way for the application of the caustic. A paste is then made of arsenious acid and orthoform, mixed with sufficient water to give it the consistence of butter. This is packed into the wounds made by the curette, noting that it penetrates deeply beneath the skin, in case the latter is undermined. If the ulcer is not over an inch in diameter, this mixture may fill the entire space level with the skin. If there is no cavity, a thick layer of paste can be spread over the part to be destroyed. A thinner layer may be spread over the surrounding skin, some dis-

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tance from the sore. Where the cancer is located near the eye, the lids are sealed with collodion and absorbent cotton. It is possible in cases to destroy an epithelioma by the application of a caustic where the ulcer extends to the lid without damage to the eye. The orthoform lessens the pain, and it has only been recently proposed as an addition to arsenical pastes. As an after-dressing it may cause dermatitis.

Physostigmine in Weakness of the Intestinal Tract.—Von Noorden, C. *Berliner Klinische Wochenschrift*, vol. xxxviii, No. 42, p. 1057, Oct. 21, 1901.

Experiments on animals have shown that the alkaloids of calabar bean have a direct action upon the intestinal tract, often emptying it of its content by the marked peristalsis set up. Since 1882 it has been used extensively by veterinarians in the treatment of colic in horses. The writer has employed it in five cases in the human being. The first of these was that of a man with heart weakness, who was operated for a hernia. Eight days after the operation tympanites developed, with cyanosis and dyspnea. One-half milligramme of physostigmine was given three times a day. This was followed by a discharge of gas, and the following morning the abdomen was no longer distended. The second case was a pelvic inflammation with marked gaseous distention of the abdomen. At first peritonitis was feared, but the temperature remaining normal, a diagnosis of distention of the intestine with gas was made, and one-half milligramme of physostigmine administered. On the fourth day the abdomen was normal. A third case was that of a woman who, since an operation for appendicitis, had suffered from constipation and accumulation of gas in the intestine. A severe attack of constipation was followed by the sudden swelling of the abdomen, due to distention of the intestine. In this case three-fourths of a milligramme of physostigmine was administered, followed by a prompt disappearance of the gas. Two other severe cases of tympanites occurring in the course of typhoid fever were successfully treated by the drug.

The salt employed is the salicylate of physostigmine, which is soluble in eighty-five parts of water.

A Method of Blood Antisepsis.—Taylor, G. G. The *Chicago Medical Recorder*, October, 1901.

The writer thinks that he has found in hydronaphthol a substance capable of antagonizing toxic conditions of the blood. Hydronaphthol is obtained from betanaphthol, and has been claimed by some writers to be identical with it. Merck says that they are dis-

tinct compounds, and that hydronaphthol is a substance which is much less toxic than betanaphthol. The writer has administered the drug, dissolved in olive oil, by the stomach. He has given as high as twenty grains daily in typhoid cases without untoward symptoms. In none of the cases in which the writer has given it have there been unpleasant symptoms traceable to the drug.

Hydronaphthol occurs in silvery-white crystals, with difficulty soluble in cold water, but hot water takes up 1 part in 100. It is freely soluble in alcohol, glycerin, and the fixed oils. It is unirritating and non-toxic, and its antiseptic power ranks next to the bichloride of mercury. It inhibits the growth of anthrax in a strength of 1 to 7200, while in a strength of 1 to 300 it is germicidal.

The writer has treated seven cases of typhoid fever at the Cook County Hospital with this drug. The cases were all severe types of the disease, and in all of the cases the medicine was administered by the mouth dissolved in olive oil, twelve grains being given daily. In all of the cases the temperature fell below 102.5° in from two to six days.

It is possible to inject the hydronaphthol with a normal salt solution directly into the veins, and in this way it may be possible to combat a general infection. The substance can be used hypodermically, but there is more or less irritation at the site of the puncture. By far the most efficient method of administration is by the mouth, dissolved in olive oil, twenty minims of which takes up one grain of the powder.

Anilin Oil.—Du Puy, Homer. *The Laryngoscope*, vol. xi, No. 4, October, 1901.

The local anesthetic effects of a solution composed of twenty grains of cocaine, absolute alcohol and anilin oil fifty minims each, are so prompt and satisfactory that it has been used extensively in anesthetizing the ear drum in tympanotomy. Out of a large number of cases in which it has been used by surgeons, no case so far reported has occurred in which there was a toxic action of the anilin constituent. There is no danger of such an accident, if after the operation the meatus is thoroughly cleansed and the excess of solution removed. Under no circumstances should a solution containing anilin oil be placed in the hands of a patient for frequent instillation. Such a case recently came under observation in which a mixture containing fifteen grains of cocaine to one ounce of anilin oil was directed to be instilled into the ear in fifteen-drop doses, every hour.

After four instillations the patient felt faint and his face became blue. Two and a half hours later he was in a state of extreme prostration. At this time the lips and nose were of a bluish-black color, the face ashen in hue, and the skin cold and clammy. The body was bathed in cold perspiration, the pulse was 136 and temperature 97.3°. The administration of strychnine and atropine, together with external heat, soon brought on a reaction, though the following morning the cyanosis was marked and the rapid pulse persisted for twenty-four hours.

Desiccated Mucin.—STUART-LOW, W. *The Lancet*, Oct. 12, 1901.

The writer reports a number of cases of irritation and ulceration of mucous membranes in which mucin was employed. One was a patient in whom a diagnosis of gastric ulcer had been made. A second patient probably suffered from gastric ulcer, and a number of others from indefinite gastric symptoms which might be grouped under the term dyspepsia.

The writer employs mucin for douching the dry nasal mucous membrane and pharynx. For this purpose it is combined with menthol in the form of a tablet, which at the time of its use is rubbed up with an ounce of lime water, in which form it may be used as a nasal douche.

Mucin is hygroscopic, but has only one-fifth the absorbent power of glycerin. Consequently, it is less irritating in its action, and better adapted for coating mucous membranes. The effect of douching the nose with this preparation is to keep the surface well moistened for a considerable time.

In stomach cases it is administered in the form of a tablet containing five grains each of sodium bicarbonate and mucin. Its introduction into an empty stomach coats the surface of the inflamed or ulcerated mucous membrane with a bland unirritating substance, which protects it from the irritation of the gastric juices. It favors regeneration of epithelium.

Treatment of Strabismus.—DAVIS, A. E. *Journal of the American Medical Association*, vol. xxxvii, No. 19, p. 1242, Nov. 9, 1901.

It would be desirable if we had a uniform standpoint for measuring strabismus. A better appreciation of the action of the ocular muscles should be sought by those treating this disease. The nonoperative treatment of strabismus, including the use of atropine, the exclusion pad, and in patients old enough the stereoscope and bar-reading, should be begun as soon as squinting is observed, for it is in

the early cases that such treatment is the most serviceable. By it false fixation and suppression of the image in the squinting eye are prevented and binocular vision maintained. Even where one of these functions has been lost, persistent effort in the non-operative treatment frequently restores it. The amblyopia in most cases of convergent strabismus is functional and acquired. It is only exceptionally that it is congenital. As soon as the non-operative treatment ceases to give improvement, it is time to operate; delay is harmful, leading to a suppression of the image in the squinting eye and an increase in the amblyopia. About 30 per cent of all cases of strabismus may be cured by non-operative treatment.

Sprinkling to Reduce Temperature.—Powell, W. L. *American Medicine*, Oct. 26, 1901.

This method has been in use in the Polyclinic Hospital of Philadelphia for a comparatively short time, and the results have been satisfactory. It is thought to be a method that will commend itself in private practice. A large rubber sheet is placed beneath the patient, the lower part folded to direct the water into a vessel placed on the floor at the foot of the bed. The head of the bed is raised about a foot. The patient is covered with a folded sheet, which is then wet by an ordinary sprinkling pot. The temperature of the water is between 60° and 70°, the temperature being altered in accordance with the conditions of the particular case. It is not dreaded by the patient, and consequently less resistance is offered. The slight rise of temperature often noted after tubbing and sponging is rarely seen after sprinkling. Three temperature charts are given which illustrate the fall in temperature produced by sprinkling.

A New Form of Eucaine.—Cohn, Paul. *Die Medicinische Woche*, Sept. 9, 1901.

The writer recounts his experience with a new salt of eucaine. Shortly after eucaine was introduced it was found to have some disadvantages. The following year beta-eucaine was prepared and put upon the market in the form of a hydrochloric acid salt. The new acetic acid derivative is superior to the hydrochlorate, in that it is freely soluble in water. Acetate of beta-eucaine in the normal eye causes a little burning after the instillation of the first drop. This can scarcely be called painful, and rarely lasts more than half a minute. The instillation is followed by a slight conjunctival hyperemia, in marked distinction to the blanching of the part when cocaine is

used. Commonly corneal anesthesia is produced in about three minutes. It has no influence upon the pupil, and there is no disturbance of accommodation. The tension of the eye remains unchanged. Symptoms of general intoxication were never noted.

Tincture of Iodine in Tonsillitis.—FLOERSHEIM, SAMUEL. *New York Medical Journal*, Oct. 5, 1901.

The author has used the official tincture of iodine applied directly to inflamed and swollen tonsils, with the best results. The application is followed by severe burning which lasts a couple of minutes, but which is relieved at the end of that time by gargling with plain water. In sixty-eight cases of acute catarrhal and follicular tonsillitis treated by this method he has experienced the most gratifying results. Relief from distressing symptoms was observed within five minutes after the application. Commonly, the swelling and redness decreased rapidly. If used early in the disease it frequently aborts the inflammatory process.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Pregnancy at the Age of Eleven Years, Terminating in Natural Delivery.—ALLEN, L. M. The *Maryland Medical Journal*, October, 1901.

The author reports the case of a colored girl 11 years of age who began menstruating at 10 years and 3 months. The patient's mental development corresponded to that of a child of 11 years. The hands and feet were small; she was fond of childish amusements. The height was 132.5 centimeters, and there was no evidence of rickets.

The interspinous diameter of the pelvis was 22 centimeters; intercristal, 21.5 centimeters; right external oblique, 18.5 centimeters; left external oblique, 18.5 centimeters; external conjugate, 14.25 centimeters; circumference, 77 centimeters; distance between trochanters, 28.25 centimeters; diagonal conjugate, 8.5 centimeters; conjugate vera, 6.5 centimeters. It was recognized that the patient had a small pelvis, but the pregnancy was allowed to advance to full term. It was decided that labor should be allowed to begin and proceed naturally in the hope that it might be terminated spontaneously. After the labor had lasted about fourteen hours the patient was put upon the examining table, and while the physician was preparing to make an examination the child was born. It was well developed. The measurements of the child's head were:

Occipito-mental, 12.6 centimeters; occipito-frontal, 11.2 centimeters; suboccipito-bregmatic, 10 centimeters; biparietal, 8 centimeters; bitemporal, 7.2 centimeters; circumference of head, 32 centimeters. The labor was easy notwithstanding a small pelvis, of the infantile type.

The writer concludes some general remarks upon abnormal pelves as follows: "There is no doubt that many cases with deformed pelvis are saved major operations by giving nature a chance. The great number of cases which have been put down as demanding a major operation, where everything has been gotten ready for operation, and in which delivery has occurred spontaneously, demonstrate that each contracted pelvis is a study in itself, and that it is almost impossible to say, except in extreme cases, what the result will be. Our methods of measuring the pelvis give only approximate results, and there is no method of measuring the fetus *in utero*. For these reasons the management of a contracted pelvis will for some time remain in doubt, and the best results will be obtained by conservatism."

Ringworm and Favus Among Schoolchildren. — MEWBORN, A. D. *Pediatrics*, Oct. 1, 1901.

Attention is called to the steady increase in the number of children with parasitic scalp affections applying for treatment in the dispensaries of New York. There is no provision in New York City for the treatment of these diseases among children, with the exception of a department connected with the Randall's Island Hospital, where from 150 to 200 children are under treatment for scalp disease.

The writer pays a splendid tribute to the work of Sabouraud, who has added so much to our knowledge of the parasitic affections of the scalp, and who has at last succeeded in founding, in connection with the Hospital St. Louis, a special department for the treatment of children affected with ringworm and other parasitic scalp diseases.

At the Ecole Lailler, as this department is called, there is regular instruction for the children, who once a week are brought into the hands of epilators, of whom there are sixteen. All the diseased hairs are removed, the remaining portion of the scalp is shaved and rubbed with a solution of tincture of iodine, iodide of potassium, and glycerin, and protected by a cap. Once a week croton oil is used in the diseased follicles, and applications of tincture of iodine and glycerin are made. Three or four months is the average time

required for the treatment of a case. The hospital is equipped with a laboratory and has a remarkable collection of cultures of the various parasites, and there are lectures and class-room demonstrations as well as an opportunity for physicians to make original investigations.

In American cities there is no special provision for the treatment of this class of cases, which are not so numerous as they are in Paris, though the school inspectors of New York report over 615 cases in that city alone. It is probable that Chicago and other large cities have a like proportion. It is believed that the increased prevalence of the disease is due to its importation at the port of New York, and more rigid inspection has led to a lessening of the number of affected children that have been brought over, so that last year but eight cases were landed.

An Epidemic of Noma.—BLUMER, GEORGE, and MACFARLANE, ANDREW. *American Journal of the Medical Sciences*, November, 1901.

The authors report an epidemic of sixteen cases of this disease. Noma is rarely seen excepting in children from three to eight years of age. In nearly 20,000 cases of sick children in London there were only eleven cases. Its favorite sites are the lips and cheeks, though rare cases have been reported in which the ears and genitals have been involved. It is a disease of high mortality. Its etiology is by no means clear, but unhygienic surroundings and the convalescence from acute disorders are varying factors. Epidemics of noma have been reported, though some writers claim that the disease never occurred in epidemic form.

The sixteen cases occurred in the Albany Orphan Asylum following an epidemic of measles. The mouth alone was affected in four, the vulva alone in two, and the rectum alone in three children. Of the fatal cases the mouth was involved in three and the rectum in four. In five of these cases pneumonia was the direct cause of death. The ages of the children ranged from three to twelve years. The causes of the epidemic are obscure, as the building is situated on high ground and is dry and well ventilated, and the children were allowed abundant out-of-door exercise. The diet, while lacking in variety, had high nutrient value. Fourteen of the cases developed in the girls' dormitory, and the remaining two were in the infirmary, where cases of gangrene were being treated. There were nearly twice as many cases of measles among the boys, but no case of noma developed among them. The first case was detected by a putrid odor coming from the patient. An examination showed

that the vulva was gangrenous; the process rapidly extended to the rectum, with complete destruction of the intervening tissues. After the discovery of this case the children were carefully examined. The other cases developed in this dormitory, where there was the possibility of contagion by soap, towels, etc., and it is significant that no case was found in the boys' dormitory, though they were under precisely the same hygienic conditions. After the cases were isolated no new cases developed.

The case began with a slight ulceration of the mucous membrane, with a surrounding area of hardness. This quickly became dark, broke down, and had an offensive odor. The process in some cases was very rapid. The process was not painful, and washing and dressing of the ulcerated surfaces caused no distress. The general treatment was stimulating. Locally there was used boric acid, hydrogen dioxide, and wet antiseptic dressings. Where the destruction was not too extensive, thorough cauterization under chloroform, with the Paquelin cautery, seemed to stop the progress of the gangrene. In four cases, not included in this series, the cauterization stopped the process so promptly as to render the diagnosis doubtful.

Nine of the sixteen cases were examined bacteriologically. One organism was constantly present. It had the form of a leptothrix, having a length of from ten to forty times its breadth. The short forms were bent; the long forms were curled or wavy. It stained poorly with gentian violet, but better with carbol fuchsin. It did not decolorize by Gram, though it stained faintly by his method. In smears from the early cases, this was almost the only organism. As the process grew older, the cover-slips showed a greater mixture of other germs. In none of the cultures did the thread-like organism which was characteristic of the early stages of the disease develop.

As a result of this investigation and of an analysis of the literature, it is concluded that noma, while originating in all probability as a simple infection, is always in its later stages a mixed infection. While it is most frequently due to a thread-like organism of the leptothrix type, it may not always be caused by the same germ.

Cæsarian Section in Placenta Previa.—ZINKE, E. G. *American Gynecological and Obstetrical Journal.*

The writer gives a tabulated list of the eight cases of Cæsarian section and Porro operations for placenta previa from 1891 up to the present. The results to the mother were three deaths, and to the child two deaths. The essential differences attending each operation are given in all except one case, which was performed under unfor-

tunate surroundings. Huston Ford, A. P. Dudley, and G. M. Boyd advocate Cæsarian section and the Porro operation as not only justifiable, but indicated in "complete" and "central" ectopic implantations of the placenta. Notwithstanding these authoritative statements, there are some who think that such operative measures should never be undertaken.

The writer claims that in two of the fatal cases the circumstances surrounding the operation were such that the death of the patient could not fairly be attributed to the treatment. The Cæsarian and Porro operations have had the full benefit of the era of asepsis; so has the treatment of placenta previa. The mortality of the former operations has improved wonderfully, but placenta previa has remained stationary. The writer pertinently asks whether abdominal section with its present low mortality cannot with considerable advantage be extended to placenta previa.

The writer believes that the Cæsarian section and Porro operation are legitimate procedures in placenta previa. The conditions which lead to a decision in favor of abdominal section are: a primipara, a closed os, an unabridged cervix, profuse hemorrhage which cannot be controlled by tampons, and firm attachment of the placenta around the internal os. Partial previas may be successfully treated in the old way, but in these cases the infant mortality must always be high.

Puerperal Gangrene of the Lower Extremities.—HAGEMEYER, G. *Wiener Klinische Rundschau*, Sept. 29, 1901.

Thrombosis of the veins of the lower extremity is not uncommon during the period of pregnancy and the puerperium. It is commonly followed by recovery, but occasionally the thrombosis in the veins and the uterus is followed by a septic inflammation. This may lead to a phlebitis which causes a general phlegmasia. The outcome in such a case is recovery, abscess or gangrene of the affected extremity. The writer reports the case of a patient 40 years of age, from a healthy family, who after an attack of influenza eight years ago developed a heart complication. She is the mother of five children, all the births being difficult. In her fourth labor there was slight right hemiplegia, and a numbness, pain, and weakness in the right leg, which yielded after some days' treatment. In her fifth confinement she gave birth to a well developed but weak child. On the ninth day there was a sudden feeling of weakness in the left leg, followed by a loss of feeling and a coldness extending as high as the knee. The following evening there was severe pain in the

leg. On the following day the toes became dry and hard and portions of the leg were blue. The leg was amputated. In the popliteal artery was found a firm clot which filled the lumen of the artery. Several arteries of the leg contained thrombi.

The writer believes that the cause of the gangrene was an embolus having its origin in the heart trouble, to which the phlegmasia was a contributing factor.

The prognosis in dry gangrene is commonly good. In the septic forms, where there is high fever and small, frequent pulse and profuse swelling, it is commonly followed by an unfavorable termination.

A Case of Spontaneous Gangrene in an Infant.—BOWES, T. A. *The Lancet*, Aug. 31, 1901.

A child fifteen days old had been previously well, with the exception of a slight attack of thrush, from which it had recovered. A small vesicle was noticed in the center of the back in the lower lumbar region. There was no history of traumatism. The following day the sac burst, leaving a small circular ulcer, and the red area spread considerably upward but not much downward. In the evening the redness had become of a deep mulberry tint, which was unaltered by pressure. The red zone had increased, and in addition the umbilicus and some of the finger-tips presented small, red, excoriated areas. The ulcer discharged a considerable quantity of thin, odorless, reddish serum. On the third day the central portions of the ulcer became black, and the dusky area reached half-way up to the shoulder blades. The superficial abdominal veins were of a light claret color, and the abdominal viscera showed as a dusky background to the inelastic pale skin of the abdominal walls. Death took place at the end of the third day. Throughout the whole case the temperature never rose above normal. No post-mortem examination was permitted. The absence of any previous disease or cachexia leads the writer to suspect that it was a case of spontaneous gangrene, the literature of which subject seems to be very meager, but four cases having been reported which bear a resemblance to this one.

Widal Reaction in the Typhoids of Children.—GERSHEL, MILTON. *Medical Record*, vol. lx, No. 21, p. 811, Nov. 23, 1901.

The main facts concerning the Widal reaction in children are the same as those in adults. Of eighty-four cases of typhoid fever in children ranging from 1½ to 14 years of age, eighty-one gave a pos-

itive result. In 115 cases of fever other than typhoid, the positive reaction was never obtained. The reaction did not occur later in children than in adults, as is claimed by some writers, but usually somewhat earlier. The Widal test is relatively of greater value in children than in adults, owing to the frequent atypical character of the disease in early life and the greater resemblance of typhoid to pneumonia and meningitis.

Essential or Toxemic Dropsy.—HERRINGHAM, W. P. *Pediatrics*, vol. xii, No. 9, p. 340, Nov. 1, 1901.

The subject of this report is a child two years of age, suffering from slight ascites which was thought to be tubercular. Following this the boy remained under treatment for debility and anemia, during which time he developed dropsy, passed very little urine, in which there was no albumin and no casts, and died from vomiting and exhaustion. At the post-mortem examination, exudate was found in the glomeruli and the convoluted tubes of the kidneys, and there was apparently some shedding of the epithelium.

This case calls attention to the occasional cases of anasarca, usually met with in children, but sometimes in adults, which resemble Bright's disease, but in which no albumin is discoverable in the urine and no abnormal condition of the heart. These cases have been called essential or idiopathic dropsy, and have received but little recognition in the text-books. Most writers have considered them as abnormal cases of nephritis in which albumin was absent from the urine, though some regard it as an independent disease.

FORENSIC MEDICINE.

Political Assassinations.—MILLS, CHARLES K. *Philadelphia Medical Journal*, vol. viii, No. 17, Oct. 26, 1901.

Political assassins are divided into four classes: (1) Sane conspirators; (2) assassins clearly recognizable as insane; (3) degenerates who are not insane; (4) degenerates of doubtful sanity. Among the sane he includes the Orloffs, the assassins of Peter III. of Russia, and in the same category places the assassins of Paul I. of Russia, Gustavus III. of Sweden, and President Lincoln. Very little is known of the assassins of Alexander II. of Russia, except that they belonged to a band of conspirators and were presumably sane.

Among the assassins whom he classes as clearly insane are Ravaillac, Louvel, and Guiteau. That Guiteau was insane the writer thinks was proven by his life, his conduct after the assassination, by the results of the autopsy and the microscopical examination of his brain. Guiteau's case now ranks among the leading ones illustrating paranoia. The writer's view is that he was not only a paranoiac, but was probably in the first stages of paresis.

The leading facts regarding this celebrated case are as follows: "At the age of 19 he left school and entered the Oneida Community, where he remained for five years; then left for a few months and subsequently returned and remained for another year, at the end of which time he withdrew from the Community and went to New York, where he contemplated the establishment of a daily paper to be called the *Theocrat*. In a letter to his father, written in 1865, speaking of his project for the establishment of a *Theocratic Press*, which was to provide the whole country with daily religious instruction, he claimed that he was in the employ of Jesus Christ & Company. The same letter abounded in similar insane extravagance. He studied law, was admitted to the bar, and practiced in a pettifogging way in New York and Chicago. He married, and afterward committed adultery to secure a divorce. In 1874 he entered a ridiculous suit for one hundred thousand dollars against the *New York Herald*. In 1875 he had a project for reviving the *Inter-Ocean*, a bankrupt Chicago paper, of which he was to be editor. In 1875, apparently in a moment of maniacal excitement, he raised an axe to strike his sister. A physician at this time said he was insane, and advised that he be taken to an insane asylum. He afterwards traveled about the country delivering trashy lectures, maintaining that he was a great evangelist. In 1879 he published a book of lectures called 'Truth, a Companion to the Bible.' In the Presidential campaign of 1880 he wrote a speech, which he once delivered in part. After the election of Garfield he began to put in important claims for office. He first applied for the position of minister to Austria, and subsequently for that of consul-general to Paris. He urged his claims in the most absurd manner, both by letter and in person, upon President Garfield and Secretary Blaine. According to his own way of putting the matter, he now 'conceived the idea of removing the President.'

"The conduct of Guiteau both during his trial and on the scaffold was consistent with the idea of insanity. I was present at his execution, and shall never forget the dramatic scene presented when

this man stood with the noose ready to be placed around his neck upon the scaffold; how he chanted the foolish rhymes of his own creation, 'I am going to the Lordy,' until, overcome with emotion, he wept and swayed to and fro like the leading character in a religious meeting characterized chiefly by excitement; and how in the speech which he was allowed to prepare and deliver he posed as a hero and a martyr. I was present also at the autopsy of Guiteau, which was made a few hours after his death. The appearance presented by his cerebral convexity was similar to that which is sometimes seen in general paresis. The pia presented an opaque appearance, which disappeared in part as the fluid oozed away. The convolutions were probably somewhat atrophied, and it will be remembered that subsequent microscopical examination of blocks of brain tissue were made independently in different cities, and the report on each was to the effect that the brain was decidedly diseased. Many gyral and fissural abnormalities were noted in the gross examination of the brain."

The third and fourth classes of assassins, degenerates not insane and degenerates doubtfully sane, may be considered together. In this group are the assassins of Marat, Carnot, Canovas, the Empress of Austria, and King Humbert. Of Charlotte Corday, the assassin of Marat, Lombroso affirms that upon inspection of her skull there were an extraordinary number of anomalies, among these being the enormous size of the orbital cavity, especially the right, which is lower than the left, as is the entire right side of the face.

Regarding Czolgosz but little has been published by the alienists by whom he was examined. J. W. Putnam, who examined him, stated that he was a young man in good health, 28 years of age, and of steady habits. He was educated in the public schools until he was 15, and was at intervals a wire-worker, blacksmith's helper, and farm-hand. He had saved $400 in six years. At the age of 21 he became a convert to anarchism, and a disbeliever, according to his own statement, in religion, government, law, God, and marriage. Czolgosz did not, at the time of his examination, sham insanity, and while he refused to discuss his crime with his lawyers, he did discuss it with others. In appearance he was more intelligent than the average Polish laborer. So far as the meager data at hand permits one to say, there is nothing that would lead one to think Czolgosz was insane, nor, indeed, do there seem to be any special signs of degeneracy, though he probably belongs to the latter class.

Defendant's Right to a Personal Examination.—The *Journal of the American Medical Association*, vol. xxxvii, No. 22, p. 1487, Nov. 30, 1901.

The Court of Appeals of Kentucky has reversed a judgment (Louisville and Nashville Railroad Company *vs.* Simpson) given for an alleged stiffness of two fingers. No other permanent injury was claimed, nor was the injury of the member apparent on inspection. At the trial she showed the hand to the jury, demonstrating how far she could close the fingers by the use of the muscles, and stated that the leaders and joints of the fingers were stiff and enlarged. A witness for the plaintiff testified that he could not tell by an examination of the hand whether it was permanently injured, but he would have to rely upon the statement of the patient. She submitted her hand to examination while he was testifying. Subsequently the company introduced two physicians as witnesses, who testified that they could tell by an examination of the hand, without reference to what the plaintiff said, whether it was stiffened as claimed, and whether such injury was permanent. The physicians who testified for the defendant were not allowed to examine the hand, and the trial judge overruled a motion compelling her to submit to their examination. The Court of Appeals held that this ruling was reversible error; to permit the party suing to testify that the member was injured permanently and to deny to other competent witnesses an opportunity to examine the hand and to demonstrate if they could that it was not in fact injured, was an abuse of the discretion lodged in the trial judge.

[Numerous references have occurred in this department of MEDICINE to invasions of the sanctity of the person, as laid down in the common law. Most courts have held that the right to refuse a personal examination to physicians is absolute with the plaintiff, but they have held that such refusal was subject to proof, and might be commented upon by the defendant. The tendency of some late decisions is to relax this rigid rule, placing wide discretion in the hands of the presiding judge.]

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ORIGINAL ARTICLES.

VALVULAR HEART DISEASE IN RELATION TO PREGNANCY AND LABOR.

BY J. CLARENCE WEBSTER, M.D.,

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Notwithstanding the very serious nature of cardiac disease complicating pregnancy, labor, and the puerperium, it is only within recent years that this important subject has received any special attention in obstetrical text-books. Though a good deal has been done of late to point out the special dangers associated with the different cardiac affections, there is at the present time some difference of opinion both in regard to the causes of these dangers and the methods of dealing with them.

Before 1871, in most text-books—*e. g.*, Burns's, Davis's, Nagele's, etc.—no mention whatever is made of heart diseases in connection with the pathology of pregnancy. There are various references to edema, dyspnea, cough, etc., but these are only considered symptomatically. Plenk in his work refers to asthmatic and other conditions which disturb the breathing, and so interfere with bearing-down efforts in labor. Ramsbotham long ago described a case of mitral stenosis which died immediately after labor, the lungs being greatly congested. Busch makes reference to heart disease merely as one of the conditions causing asthma which may be found as a complication of pregnancy. Hecker in 1860 described a case of mitral stenosis which died during a premature labor, and another of mitral incompetence which died on the twenty-third day after labor. In discussing the pathology, he thought that the lungs, being congested from the heart condition, were also much affected by diminu-

tion of the chest space by the pressure of the gravid uterus and so ceased action; he also believed that the heart might be exhausted as well from the effort of the labor. Caxeaux in 1867 pointed out the importance of endocarditis as a cause of sudden death in labor, and he indicated, as regards treatment, that the second stage should be made as short as possible, artificial delivery being employed if necessary. Spiegelberg was the first, however, to give this subject special consideration, and his paper, published in 1871, attracted a good deal of attention. He discussed the changes in the circulatory system resulting from pregnancy, comparing them with those brought about through the emptying of the uterus; he also considered the differences between mitral and aortic affections. In 1872 Peter, of Paris, wrote an important paper, referring especially to the pulmonary dangers resulting from cardiac diseases in pregnancy. In the same year Lebert wrote an exhaustive article, in which reference is made to the great dangers of affections of the right side of the heart. In 1875 Fritsch discussed the subject, attacking especially some of Spiegelberg's views. In 1876 Lahs sharply criticized Fritsch's opinions, and Fritsch replied in a valuable paper, giving an account of several interesting cases. In 1876 Löhlein discussed Spiegelberg's views, and published some new observations of his own. In 1878 Angus Macdonald wrote his valuable work containing a careful *résumé* of collected cases. In 1880 Porak published a larger number of cases. In 1888 Berry Hart wrote his paper, dwelling mainly on the relation of mitral stenosis to the third stage. Since that year a considerable number of interesting articles have been written by other writers.

It is very difficult to estimate accurately the mortality in cases of pregnancy and labor complicated by cardiac disease in which no treatment is carried out. The heaviest death-rate is in cases where pregnancy has occurred while the heart affection is of recent origin. Such cases are not common, however, and no satisfactory statistics can be given regarding them. In this paper attention will be devoted mainly to those cases in which the heart lesion is in a chronic condition.

As is well known, many of these may pass through pregnancy and labor perfectly safely and with little or no disturbance. The published mortality statistics are only approximate, and really refer to cases in which the symptoms were bad enough to attract the physician's attention. In 92 cases collected by Porak, the death-rate was 38.09 per cent; in 118 by Remy, 33.8 per cent; in 20 by Leyden, 55 per cent; in 30 by Sears, 33.3 per cent; in 77 by Wessner, 37 per cent;

in 58 by P. Müller, 39.65 per cent. When we analyze statistics more closely in order to determine the relative frequency and danger of the different varieties of heart lesion, we get the following results. (Right-sided affections are so rare that they can be put out of count. Our attention is therefore limited to mitral and aortic disease.)

Mitral Stenosis.—In Porak's 92 cases there were 13 of this variety, the mortality being 61.53 per cent; in Macdonald's 31 cases, 14, the mortality being 64.4 per cent; in Remy's 118 cases, 19, the mortality being 53.15 per cent; in Sears's 30 cases, 14, the mortality being 46.6 per cent.

Mitral Regurgitation.—In Porak's 92 cases there were 22 of this variety, the mortality being 13.63 per cent; in Macdonald's 31 cases, 8, the mortality being 50 per cent; in Remy's 118 cases, 29, the mortality being 20.68 per cent.

Aortic Lesions.—In Porak's 92 cases there were 13 with aortic lesions, the mortality being 23.07 per cent; in Remy's 118 cases, 17, the mortality being 11.76 per cent; in Sears's 30 cases, 6, the mortality being 16.66 per cent.

Combined Mitral Lesions.—In Porak's 92 cases there were 22 of this variety, the mortality being 45.45 per cent; in Remy's 118 cases, 15, the mortality being 40 per cent.

Complex Lesions (*Mitral and Aortic*).—In Porak's 92 cases there were 22 of this variety, the mortality being 50 per cent; in Remy's 118 cases, 16, the mortality being 18.75 per cent; in Sears's 30 cases, 7, the mortality being 57.14 per cent.

As far, then, as we can judge from statistics there seems to be no doubt that the most fatal lesion is mitral stenosis.

When a patient suffering from a chronic cardiac valvular affection becomes pregnant, what is likely to be the course of her history? The chief normal changes in the circulatory system during pregnancy are as follows: The vascular area is increased owing to the enormous development of vessels in the uterus and to the dilatation which occurs in the pelvic vessels, especially in the veins of the connective tissue, *e. g.*, parametric, paravaginal, and paravesical. (This is well shown in sections of the pregnant woman.)

The total quantity of blood in the maternal system is increased, there being in early pregnancy relative increase of the water and diminution of the red corpuscles, hemoglobin, and albumen, while in the late months, according to Schroeder, Fehling, and others, there is an augmentation of these latter elements. There is more extractive matter than in the non-pregnant state. The increase in fibrin elements is especially found during the last three or four

months, and is due, according to Nasse, to the breaking up of leucocytes, which are relatively and actually greater than before pregnancy. The red corpuscles are somewhat multiplied, but are relatively less abundant than in the non-pregnant state. There is therefore a relative diminution of hemoglobin, though each red corpuscle has its normal amount or slightly more than normal.

Systolic murmurs, mainly basal, develop in a considerable percentage of cases. These are probably due to the altered condition of the blood, but cardiac dilatation may be a factor in their production. The increased work demanded of the heart is met by hypertrophy, mainly of the left ventricle. Blot states that the organ increases one-fifth in weight in pregnancy. There is still a dispute as to how much of the organ hypertrophies, and as to whether dilatation occurs as well. Angus Macdonald's opinion is probably correct, viz., that all the chambers of the heart during the latter months of pregnancy become somewhat dilated. Undoubtedly increased work is demanded of the right as well as of the left side of the heart, because, as Charpentier so strongly insists, there is increased engorgement and tension in the pulmonary as well as in the systemic vascular system. It is stated by some that there is an increase in the frequency of the cardiac contractions during pregnancy, though this is denied by others. Jarissenne says that in pregnancy the pulse-rate doesn't vary with a change from the erect to the horizontal position. (This was pointed out by Graves in connection with cardiac hypertrophies generally.)

There is still a dispute regarding the interference with the thorax caused by the uterine swelling. According to Wintrich, Fabius, and others the vital capacity of the lungs is constant throughout pregnancy; according to Dohrn it is diminished. Frozen sections show that there is found in late pregnancy increased breadth and diminished depth in the thorax, but the vital capacity of the lungs is probably not much altered.

Is there an endocarditis of pregnancy?

True valvular disease rarely ever begins in pregnancy. When it does, it is probably mainly due to one of the influences which lead to its production in the non-pregnant state, *e. g.*, rheumatism, sepsis, etc. Certain writers, however, think that a true pregnancy endocarditis may arise. They point out the conditions which may favor valvular changes, *e. g.*, hypertrophy, dilatation, altered blood-pressure, increase of fibrin elements in the blood. Ollivier has described three cases in which endocarditis seemed to develop as a result of pregnancy influences. He thinks that the mitral valve is

most likely to be affected. The question is not easy to settle, though it must be admitted that the circulatory conditions of pregnancy would undoubtedly favor the development of valvular disease if a rheumatic or septic influence were present.

Acute endocarditis is very rarely found in pregnancy, and must be regarded as a more serious disease than it is in the non-pregnant.

The great majority of cases are those of chronic valvular disease of the left side of the heart which existed before the pregnancy began. The gravest cases are those in which pregnancy occurs before compensation has been well established after recent mitral or aortic disease. Of the cases in which the endocarditis is not recent, compensation having been well established, mitral stenosis is the most serious form of heart lesion. Of the two valves the mitral is more frequently affected than the aortic. Sometimes both are diseased.

The effects of pregnancy on a woman who has a valvular lesion vary greatly. These depend upon a variety of factors, *e. g.*, the situation and extent of the disease, the degree of compensation existing at the beginning of pregnancy, the general health of the patient, her habits, occupations, etc. The nutrition of the cardiac muscle may be affected by an abnormally poor state of the blood. The resulting weakness would tend to favor early or rapid failure in compensation. There is always a danger, especially when the disease is recent, that fresh fibrin-vegetations may form on the valve, owing to the increased hyperinosemia of the blood of the pregnant woman. In some cases, also, apart from mechanical stretching which may gradually affect the valve, there may be recrudescence of the original disease, which may lead to further destruction of the valve. The main element of danger common to all cases is, undoubtedly, the work thrown on the heart as a result of the increased quantity of circulating blood. This factor is most serious in the advanced months of gestation, when the uterus reaches a large size.

Another influence which plays a rôle is the distention of the abdomen, especially if this be abnormal from excessive size of the uterus, *e. g.*, where there is hydramnios, twins, or a single large child; or from flatulence and constipation.

Of great importance are disturbed metabolism and imperfect elimination, whereby toxic matters circulate and directly poison the cardiac muscle.

Indeed, the various factors introduced by pregnancy are so serious that effects may be brought about which, in the non-pregnant state, might not be met with until after a number of years. The

woman with heart disease has, *cæteris paribus*, a shorter life expectation if she exercises the function of child-bearing, and her dangers increase with succeeding pregnancies.

In some cases, owing to the perfect response of the heart to the additional strain thrown upon it, the woman may pass through pregnancy with no more discomfort than may be found in normal cases. When, however, the cardiac compensation is not sufficient, one or more of the well known signs and symptoms—*e. g.*, breathlessness, cough, dyspnea, edema, etc.—make their appearance. In aortic disease, disturbances are less common and usually less severe than in mitral disease, and they appear in most cases during the late months of gestation. The symptoms are mainly palpitation and dyspnea. In some cases premature emptying of the uterus may be caused.

It is in mitral disease, especially where stenosis exists, that the most marked symptoms occur, and though they usually supervene after mid-term, they may often develop earlier.

The increased risks to the woman in mitral disease, especially in stenosis, are pulmonary congestion and dilatation and weakening of the right side of the heart.

The health of the fetus tends to be impaired, both from the imperfectly oxygenated condition of the maternal blood as well as from the destruction of portions of the placenta by hemorrhages into it from the maternal vessels. Expulsion of the uterine contents may thus be brought about.

Sometimes death may occur in pregnancy from heart failure, without the occurrence of premature emptying of the uterus, but in most cases the fatality is associated with this event or follows it. It has been reported in connection with an abortion in early pregnancy, though this is rare.

Very few women go to full time without the appearance of some abnormal signs and symptoms. These vary considerably in different cases. Most frequent are dyspnea, palpitation, and edema. These may be slight or marked. When pulmonary congestion and dilatation of the right heart increase, the outlook is serious. Ascites, albuminuria, hemorrhages, and embolism are also very grave signs.

The majority of cases which go to term become worse during the last weeks, the symptoms being more pronounced if there be alimentary disorders causing flatulence, and thereby increased pressure on the heart through the diaphragm. Moreover, patients often become despondent and nervous, lose their appetite, and suffer from sleeplessness at this time.

Treatment. — In regard to the influence of cardiac disease in deciding the question of marriage different views are held. Very common is the opinion that no woman with organic heart disease should marry, if her well-being alone be taken into consideration. Some authorities would insist upon this restriction only in special cases, *e.g.*, in mitral stenosis, when the woman's health is not good, or when some other bodily lesion exists.

When pregnancy takes place the woman should be carefully looked after from the beginning. Her daily routine should be regular and well-ordered. She must be guarded from strain, worry, anxiety, sudden shock. Her diet should be very nourishing, easily digested, and the bowels should be carefully regulated. The woman should stay out-of-doors as much as possible in fine weather, avoiding chills and dampness; she may take easy walks and carriage drives. In the late months she must be kept more at rest, massage of the limbs being frequently beneficial.

As to medicinal treatment none is required in the few cases which have no abnormal symptoms or signs during pregnancy. In most instances tonics are needed, *e.g.*, iron, arsenic, strychnine. Strophanthus, digitalis, and nitroglycerin are of the greatest value in strengthening the heart muscle, and are indicated when there are signs of heart failure, *e.g.*, breathlessness, dyspnea, cough, edema, increasing irregularity, weakness of pulse, etc. When digitalis is used a nitrite should be given at the same time in order to counteract the effect of the digitalis in contracting arterioles and so raising arterial resistance. Diuretin is valuable in relieving edema in various tissues.

If abortion or premature labor threatens, what is to be done? It is difficult to speak decidedly with reference to this question. Some authorities advise the emptying of the uterus as a routine practice. Others are guided by the condition of the mother, urging that if she be in a good state an effort should be made to carry on the gestation. This is effected by enjoining absolute rest in bed, together with morphine administration. Sometimes it is advisable to bleed the patient once or twice.

If the patient shows evidence of heart failure in connection with the signs of premature expulsion, most authorities believe that pregnancy should be terminated. When the symptoms of cardiac weakness develop in pregnancy without the threatening of premature expulsion of the ovum, what should be the course of procedure? Here, again, different views are expressed. Some hold that any symptoms whatever justify the termination of pregnancy. Others

hold that this is too advanced a position, since many cases may be carried to full term, even though they may be at times troubled with palpitation, dyspnea, or edema of the limbs, by careful therapeutic measures.

When more severe signs arise—*e.g.*, increasing dilatation and irregularity of the heart, pulmonary edema and congestion, ascites, albuminuria, etc.—the uterus should be emptied in the great majority of cases, unless the husband and wife refuse their consent. Occasionally, the failure in heart compensation may be checked even where one or two of these grave conditions are present. But if improvement is not noted early too much time must not be wasted before the uterus is emptied. In all cases in which rapid benefit is desired, bleeding stands prominent as a therapeutic measure.

In considering the question of terminating pregnancy it must always be remembered that this procedure may be as dangerous as a full-time labor, especially when the signs of cardiac failure are marked.

The operation must be carried out with special precautions, which have for their object the avoidance of all straining on the part of the woman and of sudden rise in the blood-pressure.

In the first stage of labor trouble may start or symptoms already present may become aggravated. There may be palpitation or attacks of dyspnea. The exacerbation is due to the increased strain on the heart, and to the pulmonary congestion during the periods of uterine contraction when the circulation of blood through the uterus is interfered with. If straining efforts are made by the patient the symptoms are more marked. At the termination of the first stage after rupture of the membranes, slight relief is experienced in some cases as a result of some diminution in the size of the uterine mass owing to the escape of liquor amnii.

During the progress of the second stage the condition of the patient tends to become worse. This is probably chiefly due to the straining efforts made to bring into action the accessory powers. Moreover, the uterine contractions are longer and more powerful, and there is a resulting greater strain on the heart from the interference with the uterine circulation. The pulse may become more rapid, irregular, or intermittent, the breathing may be rapid and oppressed, the patient being restless, and having a feeling of great anxiety.

As the child escapes there may be a feeling of relief on the part of the patient from the great diminution in abdominal distention,

but this may be counterbalanced by another factor, viz., the interference with the circulation caused by the retraction of the uterus which occurs after the birth of the child. Though we do not know exactly to what extent the circulation through the retracted organ is arrested, there can be no doubt that it must be greatly slowed, less blood circulating through it, while more is thrown into the non-uterine vascular system. As a result of this there is an increased amount poured into the right side of the heart as well as a rise in arterial pressure. These changes increase the patient's risk, and often the symptoms become much worse at this time. Yet it is very rare that the patient dies immediately after the child is born. The most dangerous period is yet to follow.

It is at the end of the third stage that there is the greatest danger, especially in mitral stenosis cases. The placenta may be born all right, but immediately or soon afterward the patient may die. What is the explanation of this? Let us look at the condition of the pelvis at this time. In my researches into the anatomy of the normal pelvis during the puerperium I found that normally after the delivery of the placenta the retracted and firmly contracted uterus forms a large mass which fills the upper part of the pelvis like a ball-plug, compressing all the extra-uterine tissues against the bony wall. As a result of this the circulation in the great mass of the uterus is practically checked, the organ being quite anemic; also, owing to the pressure of the uterus, the circulation in the extra-uterine pelvic tissues is greatly interfered with. The only congested parts are the small lower uterine segment, the cervix, the vaginal wall, and neighboring parts of the pelvic floor. It is this very great alteration in the circulation which throws the extra burden on the already overburdened heart. The whole vascular area of the body has been greatly diminished, and the extra strain on the right side of the heart may be too much for it; overdistention of its already weak and thinned walls results, and its paralysis may follow. This condition in mitral disease was first pointed out by Spiegelberg. It has been described by Berry Hart, and I have also noticed it in a case of my own where death occurred. Fritsch, Barbour, and others deny that death is caused in this way. They think that extra strain is not thrown on the right side of the heart, but believe that the blood thrown out of the uterine circulation is accommodated in the extra-uterine vessels of the pelvis and abdomen, owing to the change in intra-abdominal pressure conditions consequent upon the emptying of the uterus. They say that the condition brought about is one of syncope, and that the cardiac

failure results because an insufficient amount of blood reaches the heart, which consequently begins to beat irregularly; this along with the nutritive defects leading to a fatal ending.

It is important clearly to understand the difference between these two views, chiefly because the methods of treatment based upon them differ so markedly. There is no proof of Fritsch's theory. Pathological evidence goes against it. In post-mortem cases there is usually found distention of the right side of the heart, or marked distention especially of one or both auricles, and pulmonary congestion. During life the face does not show signs of syncope, but is flushed or deeply cyanosed during the period of danger. Fritsch's theory cannot explain the death which follows emptying of the uterus in early pregnancy. It is, indeed, very interesting to note that the strain thrown on the heart by an abortion may prove too much for it. Moreover, were the theory correct, syncope might be expected often to follow normal labor, whereas it is very rare, save where much blood has been lost. That some of the uterine and pelvic blood is accommodated in abdominal parietal and visceral vessels after the uterus is empty and contracted is undoubtedly true; that this does not go on to the extent described by Fritsch is equally true. The congestion of these vessels that does occur is really a condition of safety for the patient, for the strain on the heart will be for a time diminished in proportion to the amount of blood accumulated in them. Very soon, however, the vasomotor mechanism will tend to diminish this accumulation, thereby correspondingly increasing the burden on the heart. These various factors must differ considerably in different women, and it is not therefore difficult to understand why there should be such variations in the clinical phenomena witnessed in a series of cases in which the same cardiac lesion exists.

When labor sets in, what is to be done? The patient should be carefully watched from the first. If she has been previously in good condition she may be allowed to go through the first stage without interference, an occasional dose of a stimulant being given if necessary. If she be very restless or makes straining efforts, she should be quieted. If it is impossible to manage this, and if signs of heart failure appear, the patient should be chloroformed and the cervix dilated with Barnes's bags or manually.

We are now at the second stage. In some instances she may pass through this stage without trouble. In bad cases, however, especially in mitral disease, she should not be allowed to pass through it in her own strength. She should be chloroformed by

an assistant, who gives his whole attention to his duty, while the child is extracted with forceps. Occasional injections of ether may be required. I wish, however, especially to recommend the use of nitrite of amyl. This drug was first tried with success in heart disease complicating labor by Fraser Wright, who gave it after the third stage was completed, when his patient was in danger of dying of pulmonary and cardiac congestion. Its action is to lessen the strain of the heart through the dilatation which it causes in the small peripheral vessels throughout the body, either from paralysis of the muscular fibers of the arterioles or of the vasomotor ganglia in them. Soon after its administration (from twenty to thirty seconds) its effects are seen. The drug is best given by the chloroformist in capsules containing four or five minims, which are broken and held to the patient's nose. It is also useful in opposing the tendency to chloroform syncope; a threatening of this condition may be kept off by a careful anesthetist. As the child is delivered the nitrite of amyl is of great value in neutralizing the increasing strain on the heart due to the additional blood thrown out of the uterine circulation, as a result of the uterine retraction which follows delivery.

Hypodermic injections of nitroglycerin may be used instead of amyl nitrite.

The third stage now follows, that most to be feared. Opinions differ regarding the treatment to be employed here. According to the view of those who hold that the danger is due to the accumulation of blood in the abdominal vessels and the consequent diminished supply to the heart, the loss of blood even in drops is very dangerous. According to the view which appears to me to be correct and which I have advocated, the indication is not to conserve, but to allow the free escape of a certain amount of blood from the body in order to prevent overdistention of the lungs and of the right side of the heart. How can this best be brought about? The patient is still kept under chloroform; ether is given hypodermically from time to time, and the nitrite tends to counteract the contractility of the uterus, and so to delay the separation and expulsion of the placenta. This event must not be allowed to take place naturally, because it is apt to cause too sudden a change in the vascular pressure and to prevent the loss of blood, which it is our chief aim to bring about. Neither should the Dublin or Credé method of expelling the placenta be used, for the same reason. The most satisfactory procedure is to pass one hand into the uterus, separating the placenta gradually, the other hand being placed on the abdomen against the uterus. As the

sinuses are torn through blood escapes, the amount lost being carefully watched. In carrying out this operation the greatest skill, coolness, and judgment are required. As the uterus retracts and contracts following the removal of the placenta, the heart should be carefully watched and another dose of nitrite of amyl given if necessary. If, owing to the amount of chloroform and amyl nitrite administered, marked contraction does not occur in the uterus, no alarm should be felt. This condition is better than sudden contraction, because the changes in the circulation are more gradually brought about. The organ can easily be compressed between the hands, and if necessary the hot douche can be used, but the latter agency should not be employed save where there is danger of the loss of too much blood. Neither should ergot be used in these cases, except in the last mentioned condition, because it opposes the escape of the blood from the uterus, which we desire to a certain extent to encourage. Hitherto it has been recommended by many to bleed the patient from the neck or arm. This, it appears to me, is altogether unnecessary, when we have at our disposal the easy method of bleeding from the uterus that I have just described.

The treatment of heart cases during the puerperium is of the greatest importance. Rest in bed for some weeks is advisable. For a time after delivery stimulants of ether and brandy may be required. Strophanthus or digitalis is to be given cautiously. The most easily digested nourishing food is to be taken. There should be no straining at stool or in making water. The bowels should be regulated so as to move easily, and for some days the urine should be drawn off. The retrogressive changes which take place in the heart during the puerperium introduce a new element of danger, and therefore the greatest watchfulness must be exercised. Complete quiet and good nursing are imperative. The patient should not lose sleep nor be disturbed in any way. As soon as the stomach is able to bear iron it should be given.

THE RECOGNITION OF BUTYRIC ACID IN STOMACH CONTENTS.

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The importance of butyric acid as a product of pathologic fermentations in the stomach, and the difficulty of recognizing its presence, make any advance in our knowledge in this line very desirable. The publication by Dr. Mark I. Knapp, of New York (*Medical Record*, Nov. 10, 1901), of a new test for butyric acid requires an investigation of its merits. I wish in the present article to report some experiments made in the investigation of this new test, and to present some conclusions drawn therefrom.

Dr. Knapp describes his mode of procedure as follows:

"One cubic centimeter of the filtered gastric contents is extracted with about five cubic centimeters of ether in a glass separatory funnel. The ether with the filtered chyme is shaken up a few times, and then allowed to stand for a short while to allow the ether to separate from the underlying stratum. In the meanwhile, a solution of the iron is made in the following way: One drop of a 10-per-cent solution of iron perchloride is dropped into two cubic centimeters of distilled water in a narrow test-tube. Now the lower stratum in the separatory funnel is allowed to escape by opening the stop-cock, and the remaining clear ether extract is floated on the clear iron solution. At the line of junction of the two clear fluids an orange-colored ring appears if it is butyric acid, and a rather rusty-colored ring if it is acetic acid. A few drops of alcohol will increase the intensity of the ring. To differentiate between the two—butyric and acetic—acids, a little more alcohol is added, the finger placed on the test-tube, and the test-tube shaken a few times by inverting it. If it is butyric acid, the other layer will be colored a beautiful orange; but if it is acetic acid, the ether layer remains clear."

Upon repeating this test I found that the reactions occur as described. Whether the reaction is characteristic of butyric acid is uncertain, but the test is far from delicate. Dr. Knapp found that it required fifty drops of butyric acid in five cubic centimeters of ether to give a faint reaction—that is, it requires a 20-per-cent solution to respond to the test. The stomach contents which would yield 20 per cent of butyric acid to the ether as above described must contain 100 per cent of the acid. As this is an impossibility in stomach contents, I have contented myself with extracting in the

manner described a 20-per-cent solution of the acid in water and find that it does not respond to the test. As the test fails with the acid in this dilution, it would manifestly fail when applied to stomach contents which probably never contain more than two per cent of the acid. Two per cent would give an acidity of about 200 from butyric acid alone. In one of the cases mentioned by the author the total acidity was only 120, so that it must be that something else gave the orange-colored ring instead of butyric acid. It is possible that other substances present in the stomach may enhance the delicacy of the reaction so that it may be obtained in cases where it is more dilute than the examples I have cited, but until it is certain that there are no other substances besides butyric acid which will give the reaction, we cannot depend upon results obtained in the presence of these unknown substances which may favor the appearance of the reaction.

Dr. Knapp makes the statement that butyric reacts on dimethyl-amido-azo-benzol. This statement I find needs modification. He implies by his statement that titrations for free HCl, using dimethyl-amido-azo-benzene as an indicator, are unreliable. I find that the strong solutions of butyric acid do react upon the azo color, producing the same red as hydrochloric acid, but the weaker solutions give so little change in color that they do not interfere with the accuracy of titrations.

For the purposes of testing this matter, I made the following experiments:

1. A two-per-cent solution of butyric acid was tinted with dimethyl-amido-azo-benzene. A clear red color resulted. Ten cubic centimeters were then titrated with decinormal alkali, and the orange-yellow color indicating neutralization of the free acid appeared after the addition of 1.5 cubic centimeters of the alkali. With phenol-phthalein 10 cubic centimeters of this strength of acid would require 22.7 cubic centimeters of $N\frac{1}{10}$ alkali for neutralization.

2. A one-per-cent solution was treated in the same way. The yellow color appeared after the addition of only .3 cubic centimeter of the alkaline solution.

3. Equal volumes of decinormal butyric acid and decinormal hydrochloric acid were mixed, and titrated by decinormal sodium hydroxide, using dimethyl-amido-azo-benzene as indicator for free HCl, and phenol-phthalein as indicator for the total acidity. Ten cubic centimeters required for the first titration 5.2 cubic centimeters, and for the second 10 cubic centimeters.

4. Twenty cubic centimeters of decinormal butyric acid were mixed with 10 cubic centimeters of decinormal hydrochloric acid, and 10 cubic centimeters of the mixture titrated as before. The results were free HCl 33, total acid 100.

5. A stomach contents which contained free HCl 10, total acid 30, was mixed with an equal volume of decinormal butyric acid. The mixture was then titrated and gave free HCl 5.5, total acid 65.

These experiments show that the influence of butyric acid upon the titration is so small that it may be disregarded except when it is present in very large quantity.

The distillation of stomach contents for the purpose of detecting the presence of butyric acid is not really a difficult process. It can be carried out very conveniently by means of a side-neck test-tube, a long piece of glass tubing, and a test-tube as a receiver. Ten cubic centimeters of the above mixture of decinormal butyric acid and stomach contents in which the presence of butyric acid could not be demonstrated by Knapp's method were placed in the simple apparatus described, and carefully distilled over a low flame until about half the contents of the tube had gone over. The distillate smelled strongly of butyric acid. Its acidity was 32, showing that only a part of the butyric acid had gone over, while the acidity of the part remaining in the side-neck tube was also 32, showing only a trifling loss in the distillation, since the sum of the two acidities equaled 64 and the total acidity of the original 10 cubic centimeters was 65. The fact that we have a volatile acid which smells like butyric acid is sufficient proof of its presence. I am sure that the distillation as I have described it can be carried out with very little more labor and attention than that necessary for the test described by Knapp, and the results are certainly much more satisfactory.

As a comparison of the two methods, I extracted one cubic centimeter of the mixture above described with five cubic centimeters of ether, and floated the ether above two cubic centimeters of water to which one drop of a ten-per-cent solution of ferric chloride had been added, but got only a slight deepening of color of the iron solution at the junction of the two liquids. The color was yellow, but not orange-colored. Addition of .5 cubic centimeter of alcohol produced no change. A blank experiment was made with the iron solution, five cubic centimeters of ether and .5 cubic centimeter of alcohol, which gave the same deepening of the yellow color. The tubes were allowed to stand two hours, but no changes occurred at the end of that time. The ether was then thoroughly mixed with the iron solution and allowed to separate. It remained clear, giving no indication of the

presence of butyric acid. Yet this artificial contents contained more butyric acid than is usually found in stomach contents in which it is present.

From the experiment described we may draw the following conclusions:

1. The test described by Knapp is not sufficiently delicate for clinical use.

2. Butyric acid, unless present in large quantities, does not interfere with the titration of free HCl, by the use of dimethyl-amido-azo-benzene as an indicator.

3. Butyric acid may be readily separated from stomach contents by distillation in a side-neck test tube, and may be recognized by its odor when present in moderate quantities.

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LATENT DIFFUSE GANGRENE OF THE LUNG WITH RUPTURE AND FETID PLEURISY.[1]

BY JAMES M. ANDERS, M.D.,
AND
JOSEPH McFARLAND, M.D.

The following case of gangrene of the lung is of interest because of the rarity of the condition, and its absolute latency.

John M——, aged 69 years, German, widower, shoemaker, was admitted to the male medical ward of the Medico-Chirurgical Hospital, October 18, 1901. The patient's father had died from the effects of an accident; his mother and two brothers had also died, the cause of death being unknown. The patient cannot recollect having been ill prior to the present time. For many years the patient was addicted to excessive indulgence in alcoholics, especially beer. Since about two years ago he has been drinking but moderately.

The present illness dates from October 15, 1901, when the patient was seized during the night with severe stabbing pains in the right mammary region, followed later by cough and expectoration. The sputum had a light rusty color. On October 16 a physician was called, but did not prescribe, and two days later, October 18, the patient was sent to the hospital. The symptoms and course after admission were those commonly observed in senile pneumonia. The temperature ranged between 99° and 101⅗° F., with considerable oscillations; the pulse-respiration ratio was much disturbed, and the physical signs were those of consolidation of the lower lobe of the right lung. These symptoms and physical signs continued up to within one day of death, which occurred October 21. Shortly before death took place, edema of the previously uninvolved portion of the lungs was shown by the presence of liquid, bubbling râles, but owing to the extreme debility of the patient no attempt was made to examine the lungs carefully.

At no time during the patient's illness was the slightest fetor, either of the breath or the sputum, observed. Neither was the expectoration in any way characteristic—*i.e.*, it did not show any tendency to the formation of layers on standing, did not contain fragments of lung tissue, and as previously stated failed to emit the customary horrible fetor.

AUTOPSY.—J. M——. Medico-Chirurgical Hospital, October 22, 1901. Gangrene of the lung.

[1] Read before the Pathological Society of Philadelphia, Dec. 19, 1901.

General description: Body of a somewhat emaciated old man. Cadaver in good condition. Rigor mortis moderate; livores mortis moderate. No external lesions or signs of disease.

Thorax: The *pericardium* was normal.

The *heart* was normal in size; there were milk spots upon the left and right auricles. The chambers contained yellow clots with "currant jelly" adhering to them. From the vessels, coagula ½ m. in length could be withdrawn. The muscular substance of the heart was fair, though flabby. The mitral and tricuspid valves were normal; the pulmonary valve also normal. The aortic valves were calcified at their bases; the aorta was calcareous and sclerotic at the heart, and at the arch. The anterior coronary artery was like a "pipe-stem" for about 1½ centimeters over the middle of the ventricle.

The *left lung* was adherent everywhere to the chest wall by old adhesions. The pulmonary tissue itself was somewhat edematous and congested. It was leathery in consistence.

The *right lung* was also adherent to the chest wall and was removed with great difficulty. In tearing it away from the ribs the fingers suddenly entered irregular spaces filled with greenish-brown, fetid fluid, of which probably a liter was removed. This condition constituted a *true fetid loculated pleurisy*. The lung tissue beneath was gangrenous, the entire lower lobe being involved in a diffuse gangrenous process. The tissue was greenish-black in color, pulpy in consistency, stinking and disgusting in quality. The upper lobes were in an extreme degree of edema, so that when incised clear watery fluid ran out. Over the gangrenous area there were blebs from which gas escaped under pressure when incised, evidently resulting from decomposition.

The bronchial glands were full of mineral matter—coal-dust, some of the fragments being of good size.

Abdomen.—*Spleen:* Somewhat larger than normal. Substance irregularly mottled, with congested and anemic areas.

Adrenals: Normal, that of the right side having a pultaceous medulla which broke down and transformed the organ into a sac when pressed.

Kidneys: Normal in size and shape. Smooth on surface. Capsule stripped well. Substance firm. Probably some parenchymatous degeneration, but nothing apparent to the naked eye. Pelvis and ureters normal.

Bladder: Normal.

Prostate: Normal.

Liver: Normal; biliary ducts normal and unobstructed.

Pancreas: Normal.

Intestine: The intestine was not opened. There were no external signs of disease, and the patient had had no symptoms of any intestinal trouble during life.

Stomach: Showed on the external surface, anteriorly over the lesser curvature, a white spot about 1½ by ¾ centimeters. It was less apparent on the mucous surface. It was supposed to be an old scar, though its nature is uncertain.

Esophagus: Normal.

Larynx: Mucous membrane thickened as from chronic inflammation, with what appeared to be cicatrices above the false cords, especially on the right side.

Trachea: Red and inflamed in appearance.

REMARKS.—In view of the post-mortem findings it is obvious that a careful physical examination of the right lung during the last day of the patient's illness would probably have revealed the presence of pleural effusion, though the loculated condition depending upon the extensive pleuritic adhesions makes it doubtful. On the other hand, the signs indicative of the actual condition were not in evidence thirty-six hours prior to death, when a physical examination was made, and the patient was doing well. Doubtless the gangrene which succeeded the pneumonia caused perforation of the pulmonary pleura. The absence of all characteristic symptoms of pulmonary gangrene can be explained by assuming that there was no fistulous communications with a bronchus. But this state of things could probably not have existed for any considerable length of time, and the gangrene probably developed as a terminal condition. This conclusion is also borne out by the symptoms and course of the affection up to within thirty-six hours of death.

The literature contains but few cases of latent gangrene of the lungs—*i.e.*, gangrene without characteristic symptoms. Vargas[1] reports a case of diffuse latent pulmonary gangrene in a child of three years. In this case there were signs of a massive consolidation of the lung with flat percussion note and absence of breath-sounds. The putrid odor, the fetid expectoration, etc., were absent, as in the case we report. At the necropsy the base of the lung was found to be in an eaten-out condition, the necrotic tissue projecting in regular ridges, one above the other. Again, in Vargas's case the grave general condition did not agree with that of an ordinary

[1] *Festschrift*, May 6, 1900.

pneumonia, unlike our own in this respect up to thirty-six hours prior to the fatal termination. Jacobi suggests that the etiology is probably infarction of the lung. In our own case it is highly improbable that life would have been spared so long after the occurrence of embolic infarction of the branch of the pulmonary artery that supplies the lower lobe of the right lung.

Rhymer[1] records three cases of diffuse pulmonary gangrene following influenzal pneumonia. In two, fetid expectoration and marked fetor of breath betrayed the presence of the gangrenous process, while in the third, a case of cortical pneumonia, rupture into the pleural sac was followed by pyopneumothorax which evinced the nature of the disease. According to Rhymer, the sudden development of pyopneumothorax in the pneumonia of influenza is conclusive evidence of pulmonary gangrene as a secondary event.

Riesman[2] gives brief notes of a fatal case of pneumonia in which the left lung showed a gangrenous cavity 10 x 10 centimeters containing a dark fluid; the left pleura was covered with a fibrinous exudate. During life the exhaled breath emitted a foul odor, but the sputum did not have the character of that of pulmonary gangrene.

Instances of latent diffuse pulmonary gangrene are extremely rare, very few cases seeming to be contained in the literature. Diagnosis of the condition may be easily possible and justifiable when pneumothorax develops with unusual rapidity in the course of a primary pneumonia. Latent circumscribed gangrene of the lung is far more common. One[3] of us met with a case of this sort associated with an aspiration bronchopneumonia that ended in recovery, and one[4] of us also observed a case that developed secondary to carcinoma of the esophagus, the softened necrotic tissue of the neoplasm having been inhaled through an opening in the posterior part of the right bronchus, setting up gangrene.

F. F. Wells[5] records a case occurring in a boy who had suffered a traumatic injury (contusion) of the chest. At no time was there any fetor of the breath or any fetid expectoration. In this case pulmonary gangrene was associated with empyema.

Annan[6] observed a diffuse or multiple circumscribed gangrene of the lungs in a girl aged 19. Neither cough, fetor of the breath, nor

1 *Münch. Med. Woch.*, Feb. 26, 1895.
2 Proceedings Phila. Path. Soc., Nov. 11, 1897.
3 Anders: Text-book of Practice of Medicine.
4 McFarland: Proceedings Phila. Path. Soc., Dec. 8, 1898.
5 *New York Medical Journal*, Aug. 20, 1892.
6 *American Journal of the Medical Sciences*, Philadelphia, 1841, n. s. ii, p. 107.

fetid expectoration had been present. The gangrene was found to be associated with wide-spread pneumonia.

L. E. Holt[1] reports a case in a child aged three years in whom there was no fetor to the breath, and no expectoration. At the autopsy about two-thirds of the substance of the right lung showed multiple gangrenous areas, varying in size from a walnut to a pea. Many of these patches touched each other to form irregular masses; there was no distinct line of separation between the dead and living tissues, however, as in true circumscribed gangrene of the lung.

[1] *Archives of Pediatrics*, Philadelphia, 1885, ii, pp. 88–95.

CHEMIC ASPECTS OF COCAINE UNTOWARD EFFECTS IN SPINAL ANESTHESIA.

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Recent reports of untoward effects resultant on cocaine employed in spinal anesthesia have raised the question whether the use of an alkaloid which does not conform with the requirements of identity, purity, and therapeutic property of pure cocaine may not have been the cause of such untoward results. While this question is always raised in the case of unusual effects, and while it has frequently been shown to be non-existent, still there have been instances in which substances apparently identical in chemic composition and nature proved of different therapeutic value, and the untoward effects resultant on one of these have not appeared on use of the other. The most notorious instance of this is the case of salicylic acid. When made from phenol this acid exhibits marked untoward effects which do not occur when it is made from oil of wintergreen or oil of birch.

Eliminating as the cause of the untoward effects of cocaine any decomposition to which this delicate alkaloid is liable through the influence of heat and reagents, such as may be employed carelessly in the preparation of its solutions, there remains for consideration the possibility of impurities in the alkaloid itself and in its commercial salts, chiefly the hydrochloride.

The chemistry of the drug coca is at the present time in the transition period which marked those well known alkaloidal drugs, cinchona and opium, until distinct groups of alkaloids had been isolated from them and the chemic and physiologic characteristics of these fairly established.

Although nearly two decades have elapsed since Koller announced the anesthetic effect of cocaine, it is only within a comparatively recent date that the discovery of any secondary alkaloids has been reported. These are as follows: Cocamine or isatropyl cocaine, by Hesse and Liebermann; benzoyl pseudo-tropine, by Giesel; cinnamyl cocaine, by Paul and Cownley.

The fundamental base is ecgonine, $C_9H_{15}NO_3$. From this have been made by synthesis numerous derivatives, the most important being cinnamyl cocaine made by Liebermann, and ethyl-benzoyl-ecgonine by Merck. Cocaine itself is methyl-benzoyl-ecgonine,

$C_{17}H_{21}NO_4$. This is an isomer with hyoscine, the secondary mydriatic alkaloid. The isomerism would explain certain physiologic similarities and some of the untoward effects observed in spinal anesthesia. For several years past these secondary alkaloids have been (through synthesis) so converted into ethyl-benzoyl-ecgonine or cocaine that a large proportion of the commercial alkaloid cocaine and its salts is synthetically produced, which may account for the variation in its physiologic effects. Of the bases mentioned, isatropyl-cocaine has been charged with "poisonous" properties. The tests devised for cocaine (the chief of which is that of Maclagan) have been especially designed to determine the presence or absence of this substance.

Although the accuracy of Maclagan's test is said to be almost too rigid, its simplicity commends itself to any one desirous of testing the purity of cocaine. The test is as follows: To a solution of one decigramme (0.1) of cocaine hydrochloride in one hundred cubic centimeters (100) distilled water, add one-fourth cubic centimeter (0.25) ammonia water. Upon stirring a crystalline precipitate should appear in about ten minutes and the liquid become clear. The presence of amorphous or inferior alkaloids will result in a more or less turbid liquid, and the precipitation will not be a well defined crystalline one.

Since the commercial hydrochloride contains cocaine made synthetically from the secondary bases, variable effects are to be expected from the same conditions as produce the untoward effects from salicylic acid made synthetically.

A SPECIMEN OF BOTHRIOCEPHALUS LATUS.[1]

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The specimen of *Bothriocephalus latus* which I here exhibit was brought to the nervous clinic of the Northern Dispensary by a Russian woman who seemed to be in very good health, and who had been in this country for a number of years. How long she had been harboring the worm, or how she had become infested with it, I am unable to say. Unfortunately I have lost sight of her.

Upon examination I found the parasite to be *Bothriocephalus latus;* but, to make sure, I sent some links to Dr. Charles Wardell Stiles, of the Bureau of Animal Industry, Washington, D. C., who was kind enough to inform me that they came from the bothriocephalus.

I placed the worm, which was in several pieces, in alcohol, and did not measure it until it had been in the fluid for a long time. There were altogether about 107 inches—practically three yards (2.72 m.). I did not come into possession of the head, although it is not unlikely that it was passed. As the first links of the worm are exceedingly tiny, if the head did remain, the body must have been broken off very close to it. The first links that show sexual development measure 3 millimeters transversely and 1½ millimeters vertically. The mature links near the middle are nearly twice as wide as they are long. They attain an average size of 7 x 4 millimeters. In each mature link there is a small, dark, bluish spot, centrally located, and slightly projecting from the ventral surface. The lateral incisures denoting the separation of the links are not as distinct as they are in *Tænia saginata;* but, looking down upon the flat surface, the lines of segmentation can readily be seen. The bluish spot, which represents the sexual organs, is placed a little nearer to the anterior than to the posterior end of the link. The color is not uniform in distribution in the area, but is darker in the anterior portion. The branching of the uterus is very simple, and bears some resemblance to a rosette or a Japanese letter. There is no true central stalk, but the branches are distributed somewhat symmetrically on each side of the middle line of the link. In some links I counted from five to seven branches on one side, and from four to five on the other. At the anterior extremity

[1] Paper read and specimen shown at a meeting of the Pathological Society of Philadelphia, Dec. 19, 1901.

of the rosette there are one or two knob-like projections. The eggs, which are present in enormous numbers, are oval, and have a membrane with a sharp contour. Some are colorless; others are of an olive-green or almost black color. Typical eggs with lids are rare in the links that I have examined. The majority of the ova are either quite homogeneous or look somewhat like a coffee-bean, being composed of two decidedly curved crescents with a clear space between them.

The bothriocephalus is a rare parasite in the United States. So far as I have been able to determine, Dr. Joseph Leidy was the first to find a specimen in this country. The discovery was made in this city in 1879, Dr. J. T. Walker, who presented the worm to Dr. Leidy, having obtained it from a Swedish patient after the administration of a teniafuge. The man passed about fifty feet of worm in the morning, and later in the day passed an additional one hundred feet, weighing 6½ ounces. Dr. Leidy thought that the latter mass represented portions from four or five individuals. Only one specimen is recorded in the Transactions of the Pathological Society. This was shown by Dr. F. A. Packard in 1891, and had been obtained from a Finnish sailor. If my memory serves me rightly, a specimen was also exhibited before this society by Dr. Stengel, but no record was made of the fact in our Transactions.

In 1896, Hagelstam, a practitioner from Finland, temporarily residing in the United States, discovered two cases of bothriocephalus anemia: one in a Finnish woman of Harlem, New York; the other in a lad of 12 years, in Calumet, Michigan.

The bothriocephalus has been known for nearly three hundred years, and has in that time received a great variety of names. Its present cognomen is due to Bremser, who, in 1819, gave the first careful description of the worm.

The word bothriocephalus means furrow-head, the term having been applied on account of the two grooves or depressions (*βόθριον*, groove, furrow) on the sides of the head, which take the place of suckers.

In its general surface appearance, the bothriocephalus resembles the other tapeworms; but a careful study by zoölogists has shown that it belongs to a species much lower in the scale than the Tæniadæ. It is simpler in structure, and the individualization of the different parts composing the body is less pronounced than in the latter. The head, for example, is not sharply demarcated from the neck, and hardly represents more than the anterior end of the body provided

with an attaching apparatus. The links are also but poorly individualized, and for this reason are more often detached and expelled in the feces in large chains; while in *Tænia saginata* single links are more often discharged.

The alternation of generations is less well defined than in the Tæniadæ, and in some species the larva resembles the adult, although in *Bothriocephalus latus* the distinction is clear enough. The musculature of the head and of the suckers is simpler than that of other tapeworms, the simplicity consisting principally in the absence of the cup-shaped muscles that characterize the beef and hog tapeworms. In bothriocephalus the sucking muscles are merely parts of the general somatic musculature; the latter, moreover, extends as a continuous strand, instead of being metamerically divided, as in the tenias.

The adult bothriocephalus is from two to nine meters long; the head is almond-shaped, two to three millimeters long, and provided with two deep furrows. The neck is thin and of variable length. The number of proglottides is from 3000 to 4200; they are usually broader than long, at least in the anterior part of the worm. The links have an anterior female and a posterior male surface. On both sides a circumscribed dark-blue area is recognizable, which in the mature links has a star or rosette shape. It corresponds with the egg-filled uterus, which is much simpler in structure than that of the Tæniæ. The genital pore is in the middle of the ventral surface, thus differing from that of the common tapeworm, which is at the margin of the link. The eggs are brownish, elliptical, from 0.068 to 0.071 millimeter in length, and 0.045 millimeter in width. They are provided with a small lid, which serves to distinguish them from the eggs of other worms. The growth of the bothriocephalus is extraordinarily rapid. Braun found that from thirty-one to thirty-two proglottides, representing from 8.6 to 8.9 centimeters, are formed in a day. The eggs appear in the feces twenty-four days after the indvidual becomes infested.

Development.—The developmental cycle of the bothriocephalus was for a long time a mystery; but, thanks to the labors of Braun, Schauinsland, Zschokke, and others, it has at length been determined. The egg of the worm develops into a ciliated, free-swimming larva, known as the onchosphere. From the water it enters the intermediate host, which is some form of fish, particularly the pike (*Esox lucius*) and the burbot (*Lota vulgaris*); also the perch (*Perca fluviatilis*), and perhaps the salmon. It infests the intestinal canal, viscera, and flesh of the fish, forming in them a tiny, elongated

larva, called the plerocercoid. With the flesh of the fish the larva enters the human intestine, and there develops into the adult worm. It has also been found in the dog and in the cat. Both of these, as well as man, are readily infected experimentally by the administration of measled fish. By such experiments Braun demonstrated the fact that various fresh-water fishes are the intermediate hosts of the worms. Autoinfection with the larvæ—*i. e.*, a condition of cysticercus disease, as we see it in *Tænia saginata* and *Tænia solium* —has never been observed in the case of *Bothriocephalus latus*.

Although usually single, it is not rare to find several, and even large numbers, of the bothriocephalus in the same patient. Boettcher found as many as one hundred specimens in the same person; Roux, in one patient, caused the expulsion of ninety; and Heller, in an autopsy upon an old individual, counted thirty-eight specimens. Naturally, when they are so numerous, they are small in size.

Other worms at times coexist with the bothriocephalus in the same intestine.

Distribution.—The bothriocephalus has its habitat especially near large lakes; it is common in Switzerland about Lake Geneva, in Russia, in Scandinavia, and in Eastern Prussia. It is the most common tapeworm in Japan, where both human beings and dogs are inhabited by it. In Belgium, Holland, and France it has also been found. It is said to be frequent in Ireland, and was called by Cobbold the "Irish tapeworm." It has several times been found in Italy. Regarding the United States, I have already shown that it is very uncommon here, although it is likely that, with our enormous foreign population, it will be found more frequently as time goes on.

Effects.—Like any other tapeworm, the bothriocephalus may exist in its host without producing any noticeable effects. Often, however, it will cause the ordinary group of ill-defined symptoms that we are accustomed to associate with helminthiasis. In a certain proportion of cases, however, the bothriocephalus is provocative of a very serious disease, which in every respect resembles classical pernicious anemia.

This effect of the worm was originally pointed out in 1885 by Hoffmann, but the first cases were reported by Reyer in 1886. The condition has since attracted a great deal of attention, as it throws some light upon the pathogenesis of pernicious anemia in general. As the worm is not a blood-sucker, the anemia is not easily explained. The view now generally held, which was first propounded by Schapiro,

is that the parasite elaborates a poison, or that a poison is produced by disease of the worm, or after its death, through decomposition of the dead links. Schaumann has carefully studied the subject of bothriocephalus anemia, and in a collection of seventy-two cases found a mortality of twelve, or 16.6 per cent. Schaumann and Tallqvist seem to have demonstrated that the links possess toxic properties: by feeding dogs with an extract of the proglottides, they were able to produce a decided anemia. Messiner and Calamida also found tapeworm extracts poisonous, although in their experiments the effects were principally of a nervous type. Why only a small proportion of those that harbor the bothriocephalus develop pernicious anemia is not yet explainable. A little light is thrown upon the question by the observation of Schaumann and Tallqvist that there is a decided difference in the toxic action of links from different patients. Whether those obtained from cases of pernicious anemia are more toxic than those from otherwise healthy persons has not been determined, but seems probable.

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STOPPAGE OF THE HEART IN DEATH FROM VIOLENCE.

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Recently in reading Dr. Inman on the Theory and Practice of Medicine, I came across the following passage:[1]

"After death the heart ceases to act at all, and is simply a fleshy bag. But it is to be noted that if an animal is killed in the midst of perfect health, and the heart is immediately separated from the body, it will continue to pulsate for a considerable period. We infer that it is the same in man. Now, if we examine the heart so circumstanced, and watch the gradual diminution of its beats, we shall find them *irregular* before they cease finally, and that, when they have apparently ceased entirely, they may be reproduced by direct irritation or stimulation. Hence we infer that one of the phenomena attending the process of dying in the heart is irregularity of its action; and as we know that a dead heart cannot propel blood at all, so we have reason to believe that, during the gradual loss of its vitality, there must be a diminution in the force of its contraction.

"The duration of time between the period when the heart is in full health and when it is entirely dead probably varies in different animals or individuals; but in the majority of instances it is sufficiently long to enable us to prove that *loss of power* generally, if not universally, *precedes* irregularity of action; and there is reason to believe, in many instances, that when there is deficiency of cardiac power the amount of the first irregularity is such as to be incompatible with continued life. Hence, in our own species, we not infrequently have diminished circulating power, as the only sign shown by a dying or debilitated heart."

This passage brought to my mind some observations I had made of a death from hanging on July 10, 1897, and I now transcribe the notes I recorded on that occasion, when it was my duty as medical officer to her majesty's jail to attend a criminal on the scaffold and certify to the execution.

The subject was a medium-sized, thick-set, well built man, aged 40 years, accustomed to outdoor life, in good health, and with no abnormality of the heart. On the lever being pulled by the executioner, he dropped without a sound and hung without a tremor.

[1] "Foundation for a New Theory and Practice of Medicine," by Thomas Inman, M.D. Lond., Physician to the Liverpool Royal Infirmary. 2d edn., London, 1861; p. 192.

The knot was on the left side of the neck, between the ear and the occiput.

At two minutes after, the heart was beating at the rate of 160 per minute, and with an irregular systolic murmur in the mitral area.

At three minutes after, the heart was beating strongly at 120 to the minute, every third beat being reduplicated, thus: i i ü i i ü, etc.

At eight minutes after, the heart was beating at the rate of 60 per minute, and both the heart and the pulse at wrist were intermittent, every fourth beat being omitted, thus: i i i o i i i o, etc.

At eleven minutes after, the heart was beating at the same rate, but was irregularly intermittent, as was also the pulse.

At fourteen minutes and forty-five seconds after, the heart entirely stopped.

The body was taken down fifty minutes after the execution. A rush of air from the air-passages occurred when it was lowered. There was no muscular rigidity. The neck was discolored around the rope mark. The tongue was swollen and protruded. The face was congested, but became white on pressure. The pupils were intermediate between contraction and dilatation. The surface of the chest was not congested. The penis was enlarged but not erect, and there was a clear discharge from it, like prostatic fluid.

The heart was auscultated by the bare ear against the chest outside the clothing; and the beats were unusually distinct on account of the total absence of respiratory accompaniment.

BOOK REVIEWS.

STUDIES IN THE PSYCHOLOGY OF SEX: SEXUAL INVERSION. By Havelock Ellis. Philadelphia: F. A. Davis & Co. 1901.

This is the second edition of a work which from its judicial tone, its keen analytic power, and its chaste method of presentation of the topic, met with almost universal medical approval at its first appearance. The work opens with a discussion of homosexuality among animals. This was first brought to the attention of scientists some seventeen years ago in the *American Naturalist.* The origin of sexual inversion is discussed from a biologic standpoint. Boveri and Van Beneden have lately given evidence tending to show that creation of sex differentiation in the unimpregnated ovum is the result of degenerations which make it incapable of parthenogenesis. Furthermore, as Drusing has shown, sex is not a matter of inheritance, but of maternal environment at the period of sex differentiation. This, in the human being, is marked by undifferentiated sexual organs approaching so far as their external appearance is concerned to the condition found in both male and female of the lower Sauropsidæ. If, under conditions of stress, the reproductive organs undergo normal development, while the central nervous system is arrested at the indifferent sex phase, environment then may determine one sex while the organs indicate another. In another class of cases environment at the period of sex differentiation may arrest the organs at the male phase, while the central nervous system goes on to full development. In the course of embryologic evolution the female type becomes more and more complex and altruistic, while the male remains nearer the conditions found in primitive types. With rise in evolution the female organism is sacrificed more and more for reproduction of the race (as the very term mammal implies), while the male has undergone but very slight evolution in comparison. This female evolution in organs requires an equal degree of evolution along the lines of the central nervous system involved. Arrested development consequently follows lines of least resistance, which would be the central nervous system in the case of the woman invert, and the reproductive organs in the case of the man invert. Such arrests of reproductive powers for benefit of the race normally occur among bees, where males and females are confined to reproductive functions, while neuters or workers support both, and exhibit considerable mental power in so doing. Human inverts do not reach mentally and morally the relative superiority of the workers, and hence must be regarded as defectives. Inversion and perversion are far from infrequent among primitive races. Indeed, here as elsewhere, civilization has been charged with producing conditions which it simply accumulated from primitive states, through its concentration of population. The classifications of G. F. Lydston and J. G. Kiernan are preferred by the author. There are many additions in this volume along lines confirming the views held in the first edition. Dr. Ellis's cases are in the main pure cases of inversion without the suggestion which comes from medical treatment. One conclusion at which Ellis arrives is that the school is the great breeding place of homosexuality among the general population, since in a large proportion of cases there is little obvious congenital element. It is here that social hygiene

should be adjusted. This opinion has been emphasized by Talbot (Degeneracy: its Signs, Causes, and Effects), who points out that while undue stress had been laid on the dangers of coeducation the trend of opinion shows that education limited to one sex is the source of even greater danger to both boy and girl. It is the matter of common observation among genito-urinary specialists, alienists, and gynecologists that much of the alleged "purity" so ostentatiously displayed by graduates of colleges limited to one sex is frequently the offspring of sexual perversion which, whether congenital or not, has been fostered by the environment of one sex without the modifying healthy influence of the other. The book merits a place in the library of every physician, since the profession is brought into peculiarly intimate relations with this phase of sociology. It is well issued by the publishers.

CLINICAL HEMATOLOGY. By John C. Da Costa, Jr., M.D. Price, $5.00. Philadelphia: P. Blakiston's Son & Co. 1901.

This is the most imposing work that has so far appeared, devoted to the study of the blood exclusively. It is published as a practical guide to the examination of the blood with reference to diagnosis. It contains 474 pages, together with eight full-page colored plates, three charts, and forty-eight other illustrations. That hematology is of increasing importance goes without saying; if no better evidence were at hand, the appearance of three considerable works devoted to this topic alone, within the last year, would attest its value.

The first section of this work discusses examination of the blood by clinical methods; there is first an account of the examination of the fresh specimen, and then the methods of estimating the percentage of hemoglobin. The various hemoglobinometers are described, that of Fleischl being named first, because it is evidently preferred by the author. Tallquist's method of estimating the color of a stain upon blotting-paper compared with a standard scale is named last, though its simplicity should lead to its further adoption. Its limit of error is claimed by Tallquist to be about 10 per cent, which is well within the range of other methods.

In Section II the blood as a whole is considered as to specific gravity, color, odor, reaction, etc. The various more or less pathological conditions known as oligemia, plethora, hydremia, lipemia, melanemia, glycemia, as well as uric-acidemia, are discussed. In the latter, Garrod's test for clinically detecting the presence of uric acid in the blood is given. It is said that the blood of normal individuals does not contain this substance in amount sufficiently large to be detected by ordinary clinical tests, but it is found in appreciable quantities in a number of pathological conditions. Garrod's test is still thought to be of some service, but it is no longer regarded as pathognomonic of gout, having been found in many other conditions. Under bacteriemia, the author discusses the methods of detecting germs in the blood.

Section III is devoted to hemoglobin, erythrocytes, and blood-plaques.

Section IV discusses the leucocyte and the general doctrine of leucocytosis.

Section V deals with the diseases of the blood. In this are included chlorosis, pernicious anemia, splenic anemia, secondary anemia, post-hemorrhagic anemia, leukemia, Hodgkin's disease, and the effect on the blood of splenectomy.

Section VI is an adequate discussion of the anemia of infancy and childhood. The closing section, and by far the largest in the work, is devoted to a

description of the blood as it appears in different diseases, both chronic and acute.

Taken as a whole, the work is a creditable addition to the literature of hematology, and one which will be received with favor by the profession. It is well issued by the publishers.

THE MICROSCOPE AND ITS REVELATIONS. By William B. Carpenter, C.B., M.D., LL.D., F.R.S. Eighth Edition, with 22 Plates and Nearly 900 Wood Engravings. Philadelphia: P. Blakiston's Son & Co. 1901.

It is with real pleasure that we welcome the eighth edition of this great work, and note the additions and improvements which it contains. Beginning with the principles of optics underlying the use and construction of the microscope, it covers the field with great thoroughness. It next enters upon the history and evolution of the microscope and gives an account of the many modifications through which the instrument has passed, abundantly illustrating the subject so as to make it both interesting and profitable reading.

The methods of collecting and mounting specimens, and the accessory instruments used for their proper observation, are well written and remarkably clear for a work of so wide a scope.

Following this material, which is a little library in itself, is a systematic description of the microscopic structure of plants and animals, beginning at the fungi and ascending to man. This part of the work is a vast storehouse of information. It contains the chief facts of morphology, both animal and vegetable; histology, comparative and human; and pathology, gathered together into a single systematic treatise, and presents them to the reader in a well illustrated and readable manner.

It is one of the classic works, and its appearance in eight editions should in itself be sufficient guarantee of its remarkable merit. To the physician who can afford to own but few books not strictly medical, it is to be highly recommended as being a small encyclopedia of microscopy.

THE PRINCIPLES OF HYGIENE. A Practical Manual for Students, Physicians, and Health Officers. By D. H. Bergey, A.M., M.D. Cloth, $3.00 net. Philadelphia and London: W. B. Saunders & Co. 1901.

This book is intended to meet the needs of students of medicine in the acquirement of a knowledge of those principles upon which modern hygienic practices are based, and to aid physicians and health officers in familiarizing themselves with the advances made in hygiene and sanitation in recent years. The book represents the practical advances made in the science of hygiene up to date.

Among the important subjects considered are ventilation, heating, water and water supplies, disposal of sewage and garbage, food and diet, exercise, clothing, personal hygiene, industrial hygiene, school hygiene, military and naval hygiene, habitations, vital statistics, disinfection, quarantine, etc. The idea of the book is to give the reader a clear understanding of the general principles of this broad subject.

The literary style is good and the phraseology easily readable. The modern advances seem to have been incorporated, and we note that water-purification and sewage disposal are well treated. The relation of insects to disease is given

due weight, and prophylactic measures for the prevention of malaria, filariasis, and yellow fever are considered.

It seems somewhat doubtful whether such lengthy quotations from the Quarantine Regulations as are included are really necessary.

In the tables in the appendix there are some errors that the student should avoid.

A Text-book of Physiological Chemistry. By Charles E. Simon, M.D., Baltimore, Md. Philadelphia and New York: Lea Brothers & Co. 1901.

This work attempts to cover the subject with sufficient thoroughness for all ordinary usages, and makes a point of stating the facts without being controversial. Literary references are also avoided as being unnecessary to students and practitioners.

After an "Introduction" to the "General Composition of Living Matter" and the "Forces at Work in the Living World," the author takes up the great classes of albumins, carbohydrates, and fats for systematic consideration, following their consideration by chapters upon the "Nitrogenous Derivatives of Albumins," "The Ferments," "The Digestive Fluids," the "Processes of Digestion and Absorption," and "Analysis of the Products of Albuminous Digestion." "Bacterial Action in the Intestinal Tract," "The Feces," and "The Urine" are next fully discussed, after which the author proceeds to consider "The Animal Cell," "The Blood," "The Lymph," and the various tissues. "The Eye and Ear," "The Skin and its Appendages," "The Glandular Organs of the Body," and "The Ductless Glands" are fully considered.

The work contains a large amount of carefully collected material that would be secured with difficulty without its aid. For the student it might be regarded as somewhat redundant, but for the library of the alert and information seeking graduate of medicine it should be useful and valuable.

The Surgical Treatment of Disfigurements and Deformities of the Face. By John B. Roberts, A.M., M.D. Second Edition. Philadelphia: The Philadelphia Medical Publishing Co. 1901.

This little work is a reprint of the Mutter Lectures, delivered before the College of Physicians of Philadelphia in 1900. In issuing a second edition the writer has added a chapter upon the reconstruction of syphilitic noses. In his preface he says that continued study of plastic or reconstructive surgery of the face has widened his interest in its operative field. Cases that at first were considered hopeless are approached with a confident feeling of ultimate success. The volume contains 72 pages, and opens with a review of the development of plastic surgery and its application to the face. A chapter deals with pigmentations, cicatricial distortions, and errors of development; then follows a description of the methods of dealing with deformities of the cheeks, lips, nose, ears, and eyes, and reconstruction of the lips, cheeks, and nose.

Tratatato di Psichiatria (Text-book of Psychiatry). By Leonardo Bianchi, M.D., Naples, Italy, 1901. Puntata I. Forty Illustrations.

This first instalment of a new text-book on psychiatry by the Italian alienist and neurologist Leonardo Bianchi, of Naples, contains an introduction and two chapters, discussing the cerebral cortex, its anatomy and physiology. The

second part will deal with the clinical aspects of insanity and the elementary principles of psychiatry. The third part will discuss the psychoses. Judging from the present specimen the work will be excellently illustrated with clearly outlined figures of decidedly practical value. In tone Dr. Bianchi is original and bold, yet cautious. He is an opponent of the localization doctrines which have been pushed to such an extreme extent by Holländer and other disciples of Flechsig. Speaking of the occipital association zone of Flechsig, Bianchi remarks there is no evidence which justifies the view that this region of the cortex is the anatomic substratum of the high intellectual processes in which are associated images furnished by the different perception and sensation areas. The work well deserves a translation into English. Its perusal will be well rewarded, since it is eminently suggestive along lines too much ignored by the current manuals of psychiatry now poured forth in such multitudes.

ATLAS AND PRINCIPLES OF BACTERIOLOGY. A Text-book of Special Bacteriologic Diagnosis. By Prof. Dr. K. B. Lehmann and R. O. Neumann, Dr. Phil. and Med. Authorized Translation from the Second Revised and Enlarged German Edition. Edited by George H. Weaver, M.D. Price, $5.00. Philadelphia and London: W. B. Saunders & Co. 1901.

This work is divided into two parts, the first containing 632 figures and 69 lithographic plates. In it are reproduced the apppearances of colonies of bacteria, largely cultivated upon solid media. The coloring is excellent, the pictures being represented with a wealth of detail. So far as plates are concerned, they leave nothing to be desired in illustrating so difficult a subject. In addition, the microscopic appearances of the stained bacteria are shown. In all, sixty-nine varieties of bacteria are figured, including the more important pathogenic species.

A TEXT-BOOK OF EMBRYOLOGY. By John C. Heisler, M.D. Second Edition, Thoroughly Revised. Cloth, $2.50 net. Philadelphia and London: W. B. Saunders & Co. 1901.

In its first edition this book proved itself of particular value because no recent, concise book in the English language was available for the student's use. The present edition, although not enlarged by the addition of a single page, has brought the subject entirely up to date, Chapter VI, upon "The Decidua and the Embedding of the Ovum; the Placenta; and the Umbilical Cord," having been almost entirely rewritten in conformity with the recent discoveries of Peters of Vienna and Webster of Chicago.

In its present form it is the best book for students' use, as no other is so brief, clear, readable, and complete.

NERVOUS AND MENTAL DISEASES. By Archibald Church, M.D., and Frederick Peterson, M.D. Price, $5.00. Philadelphia and London: W. B. Saunders & Co. 1901.

The third edition of Church and Peterson's work on nervous diseases presents comparatively few changes over that of the earlier editions, with the exception that further illustrations have been introduced, and a few tables which have been found by the writers to be practically useful in the class-room. The work remains as in its former editions an excellent one for the student. It includes neurology and psychiatry in a single volume.

LEADING ARTICLES.

TUBERCULAR PERITONITIS.[1]

Tubercular peritonitis is caused by the tubercle bacillus, and can be easily produced in animals by injecting tuberculous sputum into the peritoneal cavity. It is rarely a pure infection; before long other microörganisms are associated with the tubercle bacillus.

Clinically it appears to be more common in women than in men, but post-mortem experience shows that the two sexes are affected almost equally. The frequency of the disease varies in different parts of the world. Authors give the percentage of deaths due to tubercular peritonitis between 1¼ and 16. The higher number was obtained by Borschke, who, in 2450 autopsies, found 1393 cases of tubercle, and of these 226, or 16 per cent, had the peritoneum affected. Most morbid anatomists say that primary infection of the peritoneal cavity by the tubercle bacillus is rare, but Wilks and Moxon doubt this. All are agreed that a frequent source of infection is the female genital organs. The disease varies in frequency at different ages. Bottomley gives the following:

Under 10 years of age	30	cases.
10 to 20	112	"
20 to 30	137	"
30 to 40	122	"
40 to 50	93	"
50 to 60	31	"
60 to 70	11	"
Over 70	2	"
	538	"

A better understanding of the clinical symptoms is furnished by a clear mental picture of the post-mortem condition. In the simplest cases of tubercular peritonitis a number of gray tubercles, none of them larger than swan shot, are seen scattered over the peritoneum. They are found mostly under the diaphragm, and are rarest over the intestine. In such cases much fluid is often found. In the common form of tubercular peritonitis the striking thing is the enormous mass of adhesions; all of the abdominal organs may be got out of the abdomen in a solid mass, as though they had been fixed by having plaster of Paris run into the abdomen, but the abstraction of them is by no means easy, for there are numerous

[1] W. Hale White in the *Clinical Journal*, Aug. 21, 1901.

adhesions to the abdominal wall. When a cut is made across this mass a number of sections of the gut are seen, which do not collapse, being held open by adhesions. The intestinal walls are much softer than usual, so that they are easily torn. Among these adhesions there are numerous cavities containing fluid, which may be purulent, and these abscesses commonly discharge into the adjacent intestine, so that all sorts of fistulous communications are formed; and sometimes such a collection discharges externally on the one hand, and into the bowel on the other. In cases in which the adhesions are less marked, although extensive, the omentum is commonly puckered and thickened, so as to form a transverse tumor lying across the abdomen just below the transverse colon, and various other masses of the thickened peritoneum occur in different parts of the abdomen. The peritonitis may be entirely fibrous, but caseous masses are commonly present, and the mesentery is often so puckered that the intestines are drawn back to the spine. But little fluid is present in these cases, and it is commonly loculated; it varies in consistency, is usually turbid, and not rarely purulent. The abdominal lymphoid glands are usually caseous; they can rarely be felt during life, but often mistaken for them are the hard masses of peritoneum affected by tuberculous disease. Cirrhosis of the liver is frequently associated with tubercular peritonitis.

The subject of this clinical lecture is a young man aged 19, who came into the hospital on April 4, stating that for about a fortnight he had been out of sorts, suffering from abdominal pain, and lately felt so ill that he had not been able to do his work. His bowels had been irregular. On admission his temperature was 103°; he complained of pain in the abdomen, especially in the neighborhood of the umbilicus; his breath was foul; his tongue was covered with a light brownish fur; the abdomen was tumid and distended and moved with respiration; no spots were seen. On palpation it seemed abnormally resistant, the spleen could not be felt, the front of the abdomen was resonant all over, there was tenderness on percussion over the umbilicus, and there was dulness in both flanks, which disappeared when the patient turned over. In the right axillary region there was an impaired note on percussion. No Widal reaction could be obtained, and the report on May 4 says that the abdomen was gradually distending and there was more fluid. No typhoid spots had been seen. There was some dulness at the apex of the left lung. On May 9, as the abdomen was still distended, the question of operation was considered. It was also discovered that he had fluid at the base of his left lung; this was aspirated, three

pints being drawn off. On May 11, a pleuritic friction sound was heard on the right side of the chest. On May 14 the abdomen was opened below the umbilicus. The peritoneum was thickened, and when opened a quantity of serous fluid gushed out. The intestines were matted together and attached to the posterior abdominal wall. The abdominal cavity was flushed with warm sterilized water, and the wound sutured. For about a week after the operation the patient seemed a little better, but then the temperature began to rise, and from then till now it has ranged about 101°, and the signs of tubercle in the chest have increased.

The case is an example of the disease occurring in adults, beginning presumably in the abdomen. The first symptoms are poor health, the appetite is lost, the digestion suffers, irregular bowels, sometimes constipation, sometimes diarrhea. There is abdominal pain, the tongue is furred, and the patient notices that the abdomen is distended. It is then discovered that the pulse is more rapid, the temperature is up a little, and there may be sweats at night. Gradually all the above symptoms become worse, the abdomen more distended and tympanitic; the reason for this being that the bowel is easily paralyzed in this disease and gas collects. If fluid is present, as it was in this patient, there is dulness in the flanks, and if the fluid is not shut in by adhesions this dulness shifts when the patient is moved. At present the thickened omentum can be felt crossing the abdomen, which is lumpy, the umbilicus is prominent and red, the patient anemic, there is loss of weight, and the pulse is rapid and high. Later on, as the patient shows, all the above symptoms became worse; emaciation marked, the skin shrunken, dry, and brown.

There are few things more striking in medicine than the extreme distention of the abdomen in marked contrast to the general wasting. The anemia becomes profound, the feet swell, and gradually the patient sinks. The condition of the abdomen obviously varies as it is distended by fluid, gas, or both. Adhesions, too, alter the state of the abdomen. Loculi form, and they make the detection of fluctuation difficult. Often the fluid may be pressed from one loculus to another, accompanied by a gurgling sound. The fluid is sometimes as much in front of the abdomen as at the sides; because the mesentery shrinks and drags back the intestine. As the gas in the intestine varies from day to day, so the ease with which the omentum and the lumps of tuberculous matter are felt. A fecal fistula, if it occurs, is nearly always at the umbilicus; but apart from fistula, the umbilicus is often prominent, and it may be red. Peritonitis may

make micturition difficult. With these patients the appetite is often voracious, and they have extraordinary likings for unusual articles of food; they suffer much from constipation and diarrhea, and their motions are foul.

Some authors have classified the cases into acute and chronic, and have subdivided the chronic into fibrocaseous, ascitic, and fibrous; but these groups merge into each other, and as time goes on a case that at one period of its history would have been placed in one group passes into another.

Of the abdominal complications, by far the most important is fecal fistula. A fistula may form between the adjacent parts of the bowel in much the same way as fistulas form externally, but fistulous communications between adjacent parts of the bowel are only diagnosed when the communication is between the jejunum and the colon. As the food short-circuits, and so does not pass through the greater part of the intestine, the patient rapidly wastes and undigested food is found in the motions.

A grave complication is intestinal obstruction. This may be due to a band, which is rare; by far the most frequent form of intestinal obstruction following tubercular peritonitis is that which was first described in Guy's Hospital Reports, by Fagg, as obstruction due to twisting and traction.

In the early stages it is difficult to diagnose tubercular peritonitis from any slow wasting disease in which the patient gradually loses health, but abdominal pain usually puts us on the right track. A patient who is at the age when tubercular peritonitis is most common, who is slowly getting out of health and losing flesh and complaining of abdominal pain, should suggest the possibility of tubercular peritonitis.

Typhoid fever is easily confounded with tubercular peritonitis. The invasion of the peritoneum may be rapid, giving the symptoms of an acute illness. The distinction is commonly made early by the appearance of fluid in the abdomen, which points to tuberculosis. Rarely the two diseases may be distinguished by a temperature higher in the morning than in the evening; this points to tubercular peritonitis. In the later stages the difficulties of diagnosis always take the shape of determining what is the cause of the ascites. If the ascites is encysted, then it is almost certainly tubercular. Feeling the thickened omentum passing transversely across the abdomen is strong evidence that the case is one of tubercular peritonitis.

The prognosis is generally bad. The presence of tubercle in other organs may quickly determine a fatal ending. Severe gastro-intestinal symptoms often lead to an early death. It is obvious that

if the patient is suffering from severe vomiting and diarrhea which cannot be checked, he will soon succumb. Severe toxic symptoms, such as profound anemia, great wasting, high temperature, rapid pulse, and albuminuria, are all bad signs. Whatever the cause, loss of weight is extremely bad. Again, these patients always do badly if they have been taking too much alcohol, or if they are suffering from acute syphilis. Cases complicated by fecal fistula never do well, and speaking generally, the prognosis is much better in proportion as there is a large quantity of ascitic fluid in the abdomen.

The general treatment is the same as that for tuberculous disease in any part of the body. The patients should have abundant fresh air, day and night. They should be sent into the country where they can lie outdoors all day and have their windows open all night. Give plenty of good food. Clinical experience and experimental work show that tubercular patients do better upon plenty of farinaceous and fatty foods than upon proteids. In England it is customary to apply some mercurial ointment to the abdomen, and that is best done by taking equal parts of lanolin and oleate of mercury, smearing them upon a flannel binder and fastening this around the abdomen. In France iodine is used locally.

Authorities are agreed that laparotomy is more reliable than puncture. After the abdomen has been opened, some surgeons wash it out with boiled water, others use weak antiseptics, others dust iodoform on some parts, others excise caseous nodules, and some take away the Fallopian tubes if the genital organs are tuberculous; but as all surgeons appear to have equally good results, it seems clear that the chief point is merely opening the abdomen. Why this is so no one has satisfactorily explained. The difficulties of operation are often considerable; the intestines are soft and may be easily torn, the adhesions are often numerous, and it may be even difficult to get into the peritoneal cavity at all. Any operation must avoid, if possible, the formation of a fecal fistula. Experience shows that it is better to avoid drainage, and probably it is wise not to take away the female genital organs unless their removal is easy. The mortality from the operation alone is from 2½ to 3 per cent.

Never operate if the tubercular peritonitis is merely part of an acute general tuberculosis. Never operate if there is a fecal fistula, for its presence shows that there must be numerous adhesions which will make it difficult to get into the peritoneal cavity. The best results are obtained in the cases in which there is most fluid. It is quite true that those are the cases which will do well without operation; but, on the other hand, they are the cases in which the risk of operation is small, and therefore in them it is wise to open the abdo-

men and let the fluid out. Certainly you should do so if sending the patient away into the fresh air is impossible, but probably the best thing would be to open the abdomen, let out the fluid, and then send the patient to the country. The worst results are obtained when there is little or no fluid in the abdomen. In these cases the abdomen should not be opened. Localized collections of fluid show that there are many adhesions, and this kind of case, if operated, does not do well. Never incise the prominent umbilicus, for it often means that there is a tuberculous abscess under it, and sooner or later this bursts into the bowel, and if it has been opened a fecal fistula is left. If a fecal fistula has formed, do not on any account try to deal with it surgically; the most disastrous results will follow. The friends of the patient should be warned of the frequency with which the disease relapses. Lastly, it is interesting to note that operation for tubercular peritonitis sometimes benefits tubercle elsewhere in the body. Cases have been recorded in which distinct improvement has taken place in pulmonary tuberculosis after operation for tubercular peritonitis.

THE TREATMENT OF CANCER.

It has been so long held that cancer should be extirpated by the knife that it seems iconoclastic to speak of any other method. That some surgeons are disposed to differ from the accepted dictum is shown by an article by Robert Reyburn in the *Medical Record* of October 19, 1901. He writes under the caption, "Failure of the Knife in the Treatment of Cancer." For many years he advocated the removal of all cancerous tumors by the knife. Recently he has become discouraged by the fact that they have almost invariably returned, and he has been compelled to modify his views as to the benefits derived from operations for cancer. He is able to give a number of writers who agree with him as to the unfavorable results following surgical extirpation. J. M. Baldy reports only five per cent of cases of uterine cancer cured by hysterectomy. The results of the Johns Hopkins Hospital are similar. W. A. Freund was able to report only two cases of cancer of the uterus permanently cured by a surgical operation in twenty-three years.

Reyburn believes that recurrence is favored by the extensive opening of lymphatic tissues and blood-vessels by the necessary incisions. No matter how distant the incision from the disease, there is always left this liability to infection. He refers to Unna, whose experience in the treatment of cutaneous cancers leads him to prefer the Paquelin cautery as a substitute for the knife. John

Byrne has achieved excellent results in the removal of uterine cancer by the electric cautery, and regards it as by far the best method of treatment. In 1889 he reported 367 cases without a single death. It was further shown that the average length of life, post operation, exceeded that where the knife was used. Reyburn is of the opinion that the average length of life of patients not operated is two and a half years, and he thinks that operation has not materially raised the average duration. For these reasons he advocates the abandonment of hysterectomy. The preponderance of evidence, he thinks, is strongly in favor of Byrne's electrocautery operation, which entirely eliminates the question of septic infection. Recurrence following the electrocautery operation rarely takes place in the cicatrix.

We have given above the reasons advanced by Reyburn against the use of the knife in the removal of cancerous growths. The argument is a strong one, as applied to uterine cancers. We believe the evidence is strongly in favor of removal by the knife, where the incisions can be made through healthy tissue and the glands are not yet involved. Reyburn hints that the searing of the surface of an operation wound for cancer, by the actual cautery or the use of an escharotic, may be of some benefit in preventing a recurrence.[1]

Even in the operation for uterine cancer, if the average length of the life of the patient is the same, the difference between an operated case and one which is not is immensely in favor of operation. The general improvement of health which follows the operation is ample compensation. It is evident that the knife can never be a cure for cancer. After a tumor has once been removed, the patient is not thereby armed with greater resistance to the invasion of cancerous disease than before the operation, hence recurrence is almost a certainty. No statistics are given by which we can compare the frequency of recurrence in electrocautery operations, but there is no reason to think that it is less frequent than when removal is done by the knife. If there are any advantages in such a method of operating, that is another question. There is certainly nothing about an electrocautery operation over a knife that will increase a person's resistance to the invasion of the cancerous disease. In the majority of cases the cancer does not recur at the site of the original operation, but in the glands, or some of the internal organs.

In the *Lancet* of October 12, 1901, is an article by Alfred Cooper on the treatment of inoperable cancer. He is of the opinion that

[1] The late Moses Gunn was of the opinion that recurrence of cancer of the breast was delayed in cases in which the wound suppurated. This was in the days of "laudable" pus, but if cancer is due to a parasite, there is a possibility that a local suppuration and the accompanying leucocytosis may have something to do in delaying or preventing recurrence.

every cancerous growth should be removed, together with all the enlarged glands, at once, by a surgical operation. In the inoperable cases, much may be done by modern methods of treatment. Inoperable sarcoma, especially the spindle-cell variety, should be treated with Coley's fluid. The injections are made in the substance of the tumor, beginning with minimum doses. Each day the dose should be increased until the reaction temperature reaches 102° or 103° F. If no benefit results at the end of three weeks, it is useless to continue; in most of Coley's successful cases marked improvement was seen within a week of the first injection. When benefit results and there are no contraindications, it may be kept up for months. Coley has treated 148 cases, of whom 15 per cent were improved. Six of these cases afterward recurred, but the remaining 12 per cent were permanent successes. In thirty-five cases treated by other surgeons, the tumor disappeared in twenty-six.

In cases of inoperable cancer of the breast in women of about 40 years of age, oöphorectomy should be performed, and this should be followed by thyroid feeding. Of fifty-four cases of oöphorectomy for cancer, which included the whole experience of several surgeons, it was found that nineteen, or 35 per cent, were benefited by the operation. Boyd, who collected these statistics, thinks that the operation should be considered in every case of inoperable cancer, in women over 40 years of age, with no visceral or bone lesions. Cancer in other parts of the body is quite unaffected by oöphorectomy.

There has been a limited employment of thyroid feeding in cancer. Beatson has employed it in three cases, but in two of these it was associated with removal of the ovaries, so that the improvement might be attributed to the operation; in the one case in which the thyroid extract alone was given no improvement followed. In a case reported by Frederick Page, an inoperable recurrence of a mammary carcinoma, thyroid extract was administered. It was commenced in three-grain doses, which were increased until fifteen grains was administered three times a day. At the end of three months the tumor had disappeared. Six months later the growth recurred and was quite unaffected by thyroid feeding. H. T. Butlin has tried it in a good many cases, but has not obtained even temporary benefit. The favorable cases so far reported have been carcinoma of the breast, and it seems that thyroid feeding is of no benefit in carcinoma of other parts.

The treatment by Roentgen rays and by Finsen's light can hardly be classed among the methods applicable in inoperable cases, but still they may possibly be of service where the knife cannot be

employed. The one case so far reported in which the *x*-rays were used in cancer of the breast was that of a woman of 60 years, who had had a growth in the breast for seven years. Operative treatment had been declined, and the mass grew and ulcerated until the whole breast was replaced by a large ulcer. There were enlarged glands in the axilla. The *x*-rays were employed five days a week for fifteen minutes each day, and at the end of two months the general condition had improved, the pain had lessened, the ulcer had cleaned and become smaller, and the axillary glands were decreased in size.

In inoperable cases where other methods are declined, the administration of celandine (*Chelidonium majus*) is sometimes of benefit. For many years in the East Indies it has enjoyed a high reputation in the treatment of cancer. It should be given in half-grain doses in peppermint water, increasing to five-grain doses in twenty-four hours. If given hypodermically, the extract is diluted with distilled water and one cubic centimeter injected once a week. Of sixty-one cases treated by the drug, thirty-three showed improvement.

Emil Ries, in the *Illinois Medical Journal* for November, 1901, says that there has been a singular neglect of the study of involvement of the lymphatics in cancer of the uterus. The lymph channels have been carefully investigated in cancer of the tongue and breast, and where possible it has been recommended that they be extirpated at the time of the primary operation. Prior to 1895 it was taught that the lymphatic glands were rarely involved in cancer of the uterus, and it was believed that regionary involvement of the lymph glands only occurred in the final stages. The researches of Ries have shown that glands are often cancerous when they are not larger than normal. Sometimes they are enlarged when associated with ulcerative processes in a neighboring growth, and such glands may contain only hyperplastic glandular tissue, or the latter may be associated with cancerous tissue in varying admixture. The size of the cancer in the cervix bears no relation to the size of the affected glands. In one case the cancer of the vaginal portion of the cervix was not larger than a thumb-nail, but a gland was enlarged to the size of a pigeon's egg. His conclusions are that glandular involvement in cancer of the cervix does not materially differ from that of cancer in other regions of the body. An operation for cancer of the uterus in which the infiltrated glands are removed gives the patient an increased chance of complete cure. Extensive glandular involvement contraindicates all but palliative treatment. The necessity of early diagnosis of cancer is still paramount, if operation is to be successful.

EDITORIAL COMMENT.

THE DISINFECTION OF THE ALIMENTARY TRACT.

The *primæ viæ* of the new-born animal is free of bacteria and other parasites. A few hours of independent existence suffice, however, to carry to it enough germs to establish a flourishing population, that is never thereafter eradicated.

The microörganisms which are found in the intestine are swallowed, and consist of varieties common in the dust of the air, in food, and in water. Certain forms derived from milk are more common in the infant than in adults. Many forms must be swallowed, as will be evident when we remember that about twenty species occur in milk in numbers varying from 20,000 to many millions to the cubic centimeter.

The conditions existing in the alimentary apparatus are prejudicial to many of these organisms, highly favorable to others, so that a certain number for which the most appropriate environment is present establish themselves as regular parasites of the digestive tract.

The mouth has a regular flora of species derived from air, water, foods, etc., and continually receives newcomers some of the same species as the habitual residents, some of new species, so that it is difficult to predict just what microörganisms may be detected by the examination of the saliva. The organisms of the saliva are continually swallowed, thus finding their way into the stomach. Few of the swallowed organisms succeed, however, in retaining their vitality in the acid gastric juice, and but a small number pass into the duodenum. As the intestine is examined the conditions found prove to be exactly what should be expected, as the lower down the intestinal contents are examined, the greater will be the number of contained bacteria, until the dried feces of the rectum teem with countless millions.

From the time the first bacterium enters the intestine of the infant there is no time subsequently when it is free of them. From the intestine the bacteria escape with the feces and enter the earth and water, where they are very common organisms.

The most frequent organism of the intestine is the Bacillus coli communis, or common bacillus of the colon. It is a wide-spread saprophyte of the soil and water, and is commonly regarded as having its natural habitat in the intestines of animals, though it seems

more natural to think of it as a bacterium of the soil, which finds an accidental parasitic existence in the intestine highly satisfactory.

Under ordinary circumstances the intestinal bacteria do no harm. Their metabolism is associated with certain changes in the intestinal contents that are not harmful, and it is supposed that in conditions of constipation with unusual absorption of these products they are eliminated in the urine in the form of ethereal sulphates.

While it cannot be said that the metabolic products of the intestinal bacteria are harmless, it must be said that at the present time they are not known to be harmful. Their permanence in the intestine, and the consequent presence of their products being inevitable. According to all our notions of immunity the organism must be immune to them from a very early period.

In disease of the intestinal wall by which its covering epithelium is destroyed and its lymphatics opened, the colon bacillus, and other organisms occasionally present in the intestine, invade the tissues and may occasion either local or remote lesions. It is only under these conditions that the colon bacillus becomes harmful.

Occasional strangers among the intestinal flora sometimes cause great mischief, among these being the typhoid bacillus of Eberth, the cholera spirillum of Koch, and the dysentery bacillus of Shiga. It is supposed that all of these organisms enter the body by the mouth and invade it from the intestine, and in nearly all cases, in each of the diseases mentioned, the respective bacteria are present in the intestine in large numbers at some stage of the disease.

It is, however, doubtful whether the microörganisms found in the intestinal contents are at fault in these diseases, the indications being that only those which invade the tissues from the intestine, not those remaining in the intestine, are engaged in the pathogenic processes. Partly through the misapprehension that the bacteria in the intestinal contents were at fault, and partly in the hope of destroying the bacteria before they succeeded in invading the tissues from the intestine, considerable attention has been paid to the subject of "intestinal disinfection." Indeed, one professional, Nestor, advises that in all digestive disorders treatment be commenced with "a thorough disinfection of the intestinal content."

Consider for a moment the exact significance of that expression. It means to introduce a germicidal substance into the alimentary tract in a concentration sufficient to destroy the life of bacteria, and in quantity sufficient to reach from mouth to anus, and keep it there for a sufficient length of time to act distinctively upon the bacteria, and to accomplish all this without in any manner injuring a sick person.

There is very little that is occult about the operation of disinfectants. They are poisons which act chemically upon the bacterial cells and kill them. In nearly all cases they act similarly upon animal cells and kill them. In most cases the action is accomplished by a chemical union with proteid substances contained in the body substance of the microörganism, a form of combination that can also occur with other proteid substances, and by which the germicide is itself used up.

The essential conditions for disinfection are, therefore: (1) that a germicidal substance—*i.e.*, one with the power of destroying bacteria—be employed; (2) that it be used in a concentration sufficient to kill the bacteria; (3) that it act upon the bacteria in the absence of all substances interfering with its own integrity; (4) that it be permitted to act upon the bacteria for a sufficient length of time.

When we come to apply these principles to the disinfection of the intestinal canal we find that the conditions given preclude its possibility because: (1) Germicidal substances are all poisonous or irritating, so that (2) they cannot be used in the necessary concentration without poisoning the patient or destroying his tissues; (3) the stomach first receives the agent and brings it in contact with its strongly acid contents rich in proteids, albumoses, proteoses, etc., all of which more or less readily combine with most of the germicides, while the quantity of the gastric contents is sufficient to so far dilute the disinfectant as to make it fail to fulfil the second condition; (4) as the disinfectant is thus made inert by dilution or combination before it enters the intestine at all, it is impossible for it to act simultaneously upon the entire twenty feet of intestine to disinfect it.

The ready passage of the intestinal contents from place to place, the prevailing warmth and semifluid contents, and the vitality of the organisms contained in the intestine, all combine to make a partial disinfection, even should it be possible, of no use.

It has been argued that a partial disinfection of the intestine may do some good, but the same difficulties must be overcome, and to administer a small quantity of a disinfectant with the hope of achieving a small quantity of disinfection is not to understand the problem. A small quantity of an otherwise useful disinfectant is simply thrown away, as it is diluted and combined until it is entirely worthless before it can reach the intestine, while the feeble and frequently inert substances sometimes recommended for the purpose are of no use whatever.

Some hope at first followed the announcement that Prof. F. G.

Novy of the University of Michigan had discovered in the organic peroxides, especially benzozone, a substance capable of destroying bacteria in the body, and possibly useful for disinfecting the alimentary tract, but the fact that it is destroyed by proteids has blasted this hope, and the only conclusion that can be reached at the present time is that *neither the intestinal tract nor any part of it can be disinfected.*

TOXICITY OF SULPHONAL AND TRIONAL.

A number of deaths have been reported, due to prolonged administration of sulphonal. In most of the cases hematoporphyrin was found in the urine. The excretion of this substance shows that the hemoglobin of the blood has undergone a change. Its exact nature and treatment are not understood, but the persistent presence of this substance in the urine almost always indicates a fatal termination.

A few cases are on record in which patients recovered where hematoporphyrin was found in the urine, but it is uncertain as to how long it had been present.

At the time trional was introduced to the profession it was claimed to be a pure hypnotic, causing sleep with little effect upon the heart or circulation, and was thought to be devoid of toxic properties. That it is much less toxic than sulphonal is shown by the infrequent reports of intoxication from the drug. A number of cases of acute trional poisoning have been reported, but, so far as we are aware, no death. A case of acute trional poisoning was recently described by E. M. Thompson in the *New York Medical Journal* of October 12, 1901. A woman was given ten grains of trional at 8 P.M., for insomnia. The following evening the dose was repeated; at ten o'clock an additional ten grains was given, making, in twenty-four hours, thirty grains. At four o'clock the following morning the patient was restless, the temperature was slightly raised, she was delirious and had involuntary evacuations. Strychnine and stimulants soon relieved the patient, but she slept for twenty-four hours. The urine which was passed is said to have been "slightly reddish and to have contained 0.1 per cent of albumin."

It may be fairly inferred that the foregoing case was one of trional poisoning, though it is to be remembered that neurasthenic patients may present symptoms which are often attributed to the drug which happens to be given at the time.

That either trional or sulphonal is markedly toxic is not true, as

the extent of their administration is enormous. Not only are they favorites with many physicians, but they have become a domestic medicine, sold largely by druggists and self-prescribed. In a few instances a sulphonal or trional habit is formed, and it is in these cases, or where for any reason the drugs have been continued for a long time, that we have the typical and dangerous intoxications. Most of these cases are accompanied by hematoporphyrinuria, and it is among this group that the larger number of fatalities occur. A number of cases are to be found in the literature, in which toxic symptoms have been attributed to these drugs, or an analysis of clinical histories shows that they are all complicated with nervous troubles, alcohol or morphine addiction, so that it is difficult to attribute the symptoms directly to the action of the hypnotic. The symptoms of these chronic cases were tremor, local sweatings, and collapse, symptoms that often occur in the course of nervous troubles and from varying causes. It is doubtful, in the absence of hematoporphyrinuria, if they can be attributed to sulphonal or trional.

A recent report of a case of acetanilid poisoning by P. K. Brown (*American Journal of the Medical Sciences*, December, 1901), in which death took place, is instructive as pointing to the relation of hematoporphyrin to a destruction of the blood-corpuscles. The patient lived eight days after taking a dose of sixty grains of acetanilid. The specific gravity of the urine was 1.016, and there was a large coagulum on boiling. After the second day there was marked suppression of the urine; the small quantity that was passed on the third day after taking the fatal dose had the peculiar port-wine color which characterizes the presence of hematoporphyrin. This substance was identified by chemical and spectroscopic examination. On the fourth day after taking the drug, an examination of the blood showed a destructive process in the red corpuscles and a great increase in nucleated elements, most marked in the erythrocytes. The red corpuscles fell from 2,200,000 on the fifth day to 1,166,000 on the eighth day. The relation of nucleated red cells to white cells increased from one to five on the fifth day, to one to three on the eighth day. The direct action of the poison on the red cells was noticeable. They were of all sizes and shapes, the microcytes showing an unusual distortion, unlike crenation or that found in pernicious anemia. The megalocytes showed no distortion, but a striking resemblance to those of pernicious anemia. As the process advanced the microscopical findings approached more nearly those of pernicious anemia. The average diameter of the cells increased, the microcytes grew fewer in number and showed less poikilocytosis, and the color index increased.

SIX-FINGERED FAMILIES.

Among the topics now occupying the attention of certain Chicago University anthropologists is the question of six-fingered individuals. Supernumerary digits to the extent of six fingers and six toes are, as E. S. Talbot has shown (Degeneracy: Its Signs, Causes, and Results), exceedingly common among degenerates. They appear to have been quite frequent among the Egyptians, if the charms against them and the methods advised for their removal in the Ebers Papyrus be accepted as evidence. J. G. Kiernan had under observation a paranoiac (Neurologic Review, 1886), whose grandfather and father had been prophets of the Lord, as shown by the fact that on one side of the body they had six toes and six fingers, and the two sides of the body were unequal; the six-fingered one being smaller than the other. This father and grandfather were highly honored in a secluded vale in Norway as religious teachers and for their power to cure disease by charm. On admission to the insane hospital twenty years after his arrival in the United States, the patient was found to have such a decidedly asymmetric body that suspicions of general hemiatrophy were excited, but the condition was found to be congenital. The hand and foot of the seemingly atrophic side had six fingers and six toes. The man had been sent to the insane hospital in consequence of an altercation with a neighbor, who was clearly in the wrong; but, both being arrested, the patient's *amour propre* was aroused, and he declared his prophetship, which led to the trial and commitment as a lunatic. His wife, who applied for his discharge, was likewise a paranoiac. They had had ten children, of whom three were still living at the ages of six, eight, and ten. Two of these were six-toed and six-fingered unilaterally, and one of them, a boy, had the peculiar general asymmetry of the father. The third child was seemingly normal.

The influence of heredity in the production of six fingers and six toes has been, as Gould and Pyle remark, well demonstrated. The Kelleia family of Malta was one of the earliest reported. The condition may last for five generations, but often disappears on marriage with normal persons outside the community or family. A family of the Arabian Hyabites confine marriage to their own tribe. They all have twenty-four digits. Children born with a normal number are killed as being adulterine offspring. The inhabitants of Cycaux, France, till the end of the eighteenth century, nearly all had supernumerary digits either on the hands or feet. Isolated in a mountainous region, they for years intermarried. On communication being opened they emigrated or married strangers and sexdigitism vanished. Maupertius reports a German family whose members

had twenty-four digits for many generations. One of them refused to acknowledge a normal child. In one instance in the United States supernumerary digits lasted through five generations.

The following case was reported in France over a decade ago (*Revue Internat. des Sciences Méd.*, November, 1886): The first appearance of the deformity was in a man born of a degenerate family in 1752 who had six toes on one foot. His son was born with six toes on one foot, but the daughter was normal. This daughter had five children; among them were a son and daughter, each of whom had six fingers on one hand. The granddaughter had eight children, including one son, with six toes on one foot. Another son had two daughters, each having six fingers on each hand, and one daughter having twenty-four digits. This last girl had three children; the eldest son was doubly deformed like his mother; a second son had six fingers on each hand, the toes being normal. One of two daughters in the fourth generation (with only the hand affected) had eight children, several of whom were normally developed, but the rest were deformed as follows: One daughter had an osseous thickening at the end of the digits; one son had twenty-four digits and another had twelve fingers, the toes being normal in number. Polydactylia, as Fere has shown (La Famille Nervopathique), is often associated with absence or union or decrease in the size of the bones of the extremities. It is a hypertrophy resultant on the intra-uterine struggle for existence between the organs, and may be the sole evidence of defect resultant on that struggle.

ISTHMIAN CANALS FROM THE STANDPOINT OF HEALTH.

George A. Soper in a recent article ("Sanitary Aspects of the Panama and Nicaragua Canals," *Medical News*, Jan. 4, 1902) discusses the relative value of the proposed routes from the standpoint of health.

The morbidity which prevailed at the time the Panama Canal was under construction, between 1882 and 1884, was enormous. The chief infections were smallpox, yellow fever, and malaria. The loss of life was very great; thirty-seven engineers out of one hundred died during the months of March and April, 1882. There were many sanitary abuses during the preliminary work upon the canal, which evidently could be overcome by a better organization.

The health conditions of the Nicaragua route are similar to those of Panama. The humidity in the lower altitudes is very great.

Both coasts of Nicaragua are malarious, and dysentery is a prevalent disease. Both routes pass through countries which are unfavorable to health, the one advantage of the northern route being a lessened rainfall. Considerations of soil, topography, and the nature of the engineering work are in favor of Panama. In constructing the canal at the latter place a less number of men will be required, they would be more concentrated, and hence more easily protected. There is no difference in the nature of the diseases to be anticipated, nor in the precautions to be taken to protect health, in either case. After construction, the difficulty of controlling health conditions will be greater along the Nicaragua route. The liability of vessels to infection in passing through the canal would be greater in the Nicaragua route, because it is longer.

If, in constructing either of these canals, the terrible experience of the French and those engaged in directing the work two decades ago is to be repeated, it will be an amazing blot upon our boasted sanitary science. Within the period named many important discoveries have been made, which ought to enormously lessen the mortality and sickness in such a work. It is now well understood that yellow fever and malaria are transmitted by mosquitoes, and some of the most deadly dysenteries of the tropical regions are due to intestinal parasites, which can be avoided by proper care. Smallpox, which played an important part in disease production when the canal was first begun at Panama, can surely be eliminated by proper vaccination. Typhoid fever should be a thing of the past in any camp which has a proper sanitary police. If the lesson has been thoroughly learned that there is nothing especially dangerous in the air or temperature in tropical regions, and that the climatic conditions which prevail in such places only favor disease by encouraging the growth of parasites which are inimical to man, and that infection is of necessity by contact, then the means at our command for maintaining health in such a situation are simple. It only requires vigilance to protect the health.

A SECOND ANTITOXIN EPIDEMIC OF TETANUS.

Coincident with the St. Louis epidemic following the administration of antitoxin for diphtheria, which was referred to in the December issue of MEDICINE, an epidemic is reported from Milan (*Journal de Médecine de Paris*, Nov. 24, 1901). The serum in this case was furnished by the Pasteur Institute of Milan. Twenty-two children in different portions of Italy died from the injection of this serum. A large number of others were affected but survived. Immediate

steps were taken by the government to limit the use of the contaminated serum, and the institute in question was closed. The director of the institute, Belsonti, as well as the one who prepared the serum, were charged with homicide by imprudence. Both were acquitted, apparently because the institute in Milan is situated in the neighborhood of a veterinary school where antitetanus serum is prepared.

ARSENICAL OR ALCOHOLIC NEURITIS.

The recent epidemic of neuritis that has occurred in the north of England serves to call attention to the possibility that many of the cases which have heretofore been regarded as of pure alcoholic origin may have been due to arsenic. In the out-patient department of the Manchester Hospital, alcoholic neuritis has been a common disease, but in the latter half of the year 1900 there was a very marked increase in the number of cases. Dr. Reynolds of the Manchester Work-House Infirmary noted that many of these cases were preceded by a suffusion of the eyelids, coryza, or inflammation of the skin, which led him to suspect the presence of some substance other than alcohol as giving rise to the neuritis. A questioning of these patients showed that while most of them had been in the habit of taking distilled liquors, they had also used beer, some of them not more than three or four glasses each day, others a larger quantity. An examination of the beer showed the presence of arsenic. Upon tracing the source of this arsenic, it was found to be due to the use of glucose and certain inferior sugars which had been manufactured with sulphuric acid contaminated by arsenic.

A study of these cases leads to the conclusion that pure alcoholic neuritis is much less common than has been generally supposed. This is in accord with observations made on animals, which show that an experimental alcoholic neuritis rarely if ever occurs. Since the identification of the arsenic in beers and the prompt action taken by the brewers in furnishing a beer uncontaminated by arsenic, there has been a practical disappearance of cases of "alcoholic neuritis" from the Manchester district, notwithstanding that there has been only a slight falling off in the consumption of distilled and fermented liquors.

It may be that most of the cases of alcoholic neuritis that have been reported are really due to arsenical poisoning, but it is to be remembered that the inflammation of the eyelids, reddening of the skin, and other symptoms which first directed attention to this epidemic, are not common in alcoholic neuritis. It is a not improb-

able supposition that there may be an associated toxemia. It has been observed among lead-workers that those who were addicted to the use of alcohol suffered in a greater degree from the effects of lead than those who were temperate, the alcohol seeming to furnish a predisposition to, or an aggravation of, the plumbism. It is possible that such an explanation accounts for some of the facts observed in the Manchester epidemic. A dose of arsenic that would not ordinarily have caused a neuritis in the absence of alcohol, was capable of producing it with this superadded factor. The facts so far observed show conclusively that many of the cases which have been regarded as alcoholic neuritis are due to other poisons, and that the accidental contamination of beer by arsenic furnishes the majority of such cases.

ABSTRACTS.

MEDICINE.

Cryoscopy.—Ogston, Alexander. *Lancet*, vol. clxi, No. 19, p. 1253, Nov. 9, 1901.

The term cryoscopy, to which very little attention has been given in England and America, refers to the freezing-point of blood and other secretions. This is of value as an aid to prognosis, and as a means of investigating the fluids of the body. It is destined to rank high in clinical medicine. Fluids freeze at a lower temperature in proportion to the impurities dissolved in them. Koranyi determined that the blood possessed a fixed freezing-point of 0.56° C. below that of distilled water. It does not vary more than one one-hundredth of a degree up or down. Urine is not so steadfast, varying in its freezing-point nearly a degree, in proportion to the solids contained in it. The variation in the freezing-point of blood and other fluids has been extensively studied. The conclusion has been reached that blood which is normal and from which effete constituents have been adequately eliminated has an average freezing-point of 0.56°, the range being 0.55° to 0.57°. If elimination is defective, the freezing-point sinks below this point, falling to 0.58°, 0.60°, and, in one case observed by Kummell, to 0.71°. The writer's experience is that cryoscopy applied to the urine is of little value from a clinical standpoint, nothing being added to that which is obtained by a study of specific gravity and the special chemical reactions of that fluid.

The principal use which the author has made of the method is in determining the prognosis in surgical operations. A number of case histories are given in which the striking prognostic value of the lowered freezing-point of the blood is shown. One patient who was recovering from interstitial nephritis, though traces of albumin were still found in the urine, and whose general condition was good, resumed his work. The cryoscopic findings showed a freezing-point higher than normal, and consequently elimination by the kidneys was efficient. Another patient wished a radical cure for inguinal hernia. He appeared to be well and strong, there was no albumin or sugar in the urine, but there was a slight yellowness of the conjunctiva which suggested hepatism, that insidious foe of the operating surgeon. His blood froze at 0.58°—that is, $\frac{2}{100}$ below normal.

The operation was declined. He died four months later, and it is probable that if operation had been performed it would have been followed by an early fatal result.

The writer is of the opinion that cryoscopy of the blood will furnish valuable information in a class of cases in which the surgeon has heretofore been able to only conjecture. Not only is it of use in determining inefficient depuration of the blood by the kidneys, but it is a valuable means of detecting disease of the liver.

Value of Sputum Examinations in Pulmonary Tuberculosis.—BROWN, LAWRENCE. *Montreal Medical Journal*, vol. xxx, No. 10, p. 769, November, 1901.

The most important part of the examination of sputum is the detection of the tubercle bacillus. Their number, form, and arrangement are of no prognostic importance. It is error to say that a patient is improving because there are fewer bacilli in the sputum. Only a fraction of the total number of bacilli in any preparation are stained. Old foci may give off very few and younger foci may yield no bacilli at all, yet their formation may be actively going on. The tuberculous focus may be shut off for a time by an occluded bronchus. Absence of tubercle bacilli from sputum is of comparatively little diagnostic or prognostic significance, excepting where the examination is repeated for four to six successive days.

A negro aged 32, admitted to the Johns Hopkins Hospital, was thought to be suffering from pneumonia. The number of leucocytes reached 12,000. On the tenth day, no crisis having occurred, the expectoration was examined for tubercle bacilli, with a negative result. On the twelfth day they were found, and the diagnosis was changed to tubercular pneumonia. Dulness over the left lower lobe persisted, and on the fifty-fifth day of the disease an empyema discharged through an intercostal space. The tubercle bacilli had not in the meantime disappeared from the sputum.

The recognition of a single typical bacillus is sufficient to establish the diagnosis, but it must be certain that the object seen is a bacillus. The chief difficulty for the beginner is in mistaking other things for the bacillus. The usual course of chronic phthisis gives an increase in the bacilli as the destruction spreads. A sudden increase in the tubercle bacilli, especially if they are numerous and diffuse and associated with an increase in the cellular elements of the pulmonary tissue, bespeaks an ominous prognosis. The continuous expectoration of many bacilli usually points to the presence of a cavity. Few and many bacilli in alternation usually indicate a cavity that

opens from time to time. This corresponds with the clinical observation that signs of a cavity may be present one day and absent a few days later. No case of tuberculosis can be regarded as cured unless the tubercle bacillus is absent from the sputum. Continued presence of the bacillus in the sputum does not necessarily mean that the disease is in active progress. A case has been reported in which bacilli were found in every examination for fourteen years, during which period the patient was actively at work.

The form of the bacillus has a greater bearing upon the prognosis. The chief difficulty lies in the fact that it is rare for the bacillus to have all one form. The preponderance of the short bacillus indicates rapid growth, and of the long, slow proliferation.

The Effect of Electric Currents and X-rays on Bacteria.—ZEIT, F. R. *Journal of the American Medical Association*, vol. xxxvii, No. 22, p. 1432, Nov. 13, 1901.

In view of the extravagaut claims that have been made regarding the effect of electric currents upon microörganisms, it is time that we had some accurate experimental data upon the subject. This article is devoted to a study of the effects of direct, alternating, and Tesla currents and x-rays on bacteria. There is very little reference in text-books upon bacteriology or those on therapeutics to the effects of electricity in overcoming infections. So far, little has been done to answer the question as to the effects of electric currents upon microörganisms. Are they due to the production of antiseptics, or do they act by electrolysis? Can the various electric currents have bactericidal or antitoxic properties, without electrolysis or heat? Can tissue changes be caused by electrolysis or heat which may cause the death of the bacteria? How does a magnetic field affect bacteria?

A continuous current of 260 to 320 milliamperes passed through a bouillon culture kills bacteria in about ten minutes, death being caused by the elevation of temperature. The antiseptics produced by electrolysis are not sufficient to destroy bacteria of feeble resisting power. A continuous current of 48 milliamperes passed through a bouillon culture for from two to three hours does not kill the feeblest bacteria, as the temperature produced by such a current does not rise above 37° C., and the electrolytic products are antiseptic, but not germicidal. A continuous current of 100 milliamperes passed through a bouillon culture for seventy-five minutes kills all non-resistant forms of bacteria when the temperature is kept artificially below 47° C. The effect is due to the formation of

germicidal electrolytic products in the culture. The continuous current alone, apart from its thermal or chemical effects, is neither bactericidal nor antiseptic. A magnetic field, either within a helix of wire or between the poles of a powerful electromagnet, has no antiseptic or bactericidal effects. Alternating currents of a three-eighths Ruhmkorff coil seem to favor bactericidal growth and pigment production. The same is true of the Tesla currents.

Cultures of non-resistant bacteria could not be killed by exposures to the Roentgen rays for forty-eight hours, at a distance of twenty millimeters from the tube. Tubercular sputum exposed to the action of the Roentgen rays for six hours in every instance caused tuberculosis in guinea-pigs. The experiments show conclusively that the Roentgen rays have no direct bactericidal properties. The clinical results must be explained by other factors.

The Psychoses of Chorea.—MOYER, HAROLD N. *Journal of the American Medical Association*, vol. xxxii, No. 21, p. 1378, Nov. 23, 1901.

The occurrence of a well marked psychosis during an attack of the chorea of Sydenham is exceptional. A case reported is that of a fairly well developed girl, 15 years of age, without neurotic heredity. In the spring of 1900 she developed choreic movements, well marked in the upper extremities, which later became general. In the third week she became acutely maniacal, restless, sleepless, singing, dancing about, knocking against the furniture until the skin became excoriated and bruised in many places. Under treatment, which included rest in bed, there was a gradual lessening in the choreic movements and a disappearance of the mental symptoms. The following spring, a year after the first attack, the chorea returned, and with it the acute maniacal condition. The symptoms presented were identical with those of the first attack.

A study of the literature, as well as a careful observation of ten cases of chorea in which the mental phenomena were carefully noted, leads the writer to the following conclusions: (1) A well marked alteration of the character and mentality can be noted in the majority of cases of chorea, usually preceding by some weeks the onset of the choreic movements. (2) Dazed hallucinatory phenomena are present in a considerable number of cases, not of sufficient severity to merit being classed as a distinct psychosis. (3) The mental disturbance in chorea usually comes on after choreic movements, but it may precede them. (4) The type is usually maniacal, though it may occasionally be melancholiac, or present the character of an acute delirium. (5) Mental disturbances in chorea are most frequent in

older children, it being rarely observed before the twelfth year. (6) Choreas accompanied by mental disturbances later in life are almost always due to organic changes in the central nervous system. (7) The prognosis is favorable when the mental disease complicates the simple acute chorea of Sydenham.

Sclerotic Carditis.—CAMPBELL, G. G. *Montreal Medical Journal*, vol. xxx, No. 11, p. 841, November, 1901.

The child in whom this diagnosis was made was seen in January, 1901. At that time it was thought that the lesion might be congenital or an aortic regurgitation; the probabilities pointed to a mediastinal pericarditis. The physical signs were bulging of the chest wall corresponding to the outlines of the heart, a forcible diastolic thrill felt at the second left interspace, increase of the cardiac dulness to the left of the sternum and upwards, and a rough diastolic murmur transmitted to the left.

On the death of the patient a partial autopsy was obtained, which showed the pericardium to contain a small amount of clear fluid and no adhesions. The heart was large, weighing 300 grammes; all of the valves appeared to be normal, the post-mortem measurements indicating no changes of importance. Both auricles were slightly dilated. The right ventricle was dilated and hypertrophied; the left ventricle presented the same condition, but not so marked. Upon casual observation, the left ventricle would have been called the right. The wall of the right ventricle showed sclerotic changes, including the columnæ carneæ. The coronary arteries were small, but healthy looking. It is thought that there was relative incompetence during life, without any deformity of the pulmonary valves. The extreme hypertrophy and dilatation of the right ventricle, with the diastolic murmur or thrill, would explain the accentuated second sound. The primary cause of the condition is not evident, as there was no pulmonary lesion or congenital narrowing of the pulmonary vessels to account for a hypertrophy of the right side of the heart. The increase in dulness above and to the left of the heart is not accounted for by the post-mortem findings. The sclerosis did not include the aorta and pulmonary artery, so far as they were examined.

Bacilli in the Blood of Typhoid Fever Patients.—HEWLETT, A. W. *Medical Record*, vol. lx, No. 22, p. 849, Nov. 30, 1901.

The blood of twenty-four typhoid patients has been examined at the New York Hospital, and the typhoid bacillus found in seventeen of the cases upon the first examination. In three others positive

results were noted during a relapse—in all, a positive finding in 83 per cent of the number investigated.

In making cultures from the blood, five cubic centimeters of blood is taken from the vein at the elbow, and is then diluted in three flasks of sterile bouillon. If a motile bacillus appeared, they are identified by taking their reaction to a known serum. Under favorable circumstances a positive result can be obtained in about thirty hours. If plating of the culture is necessary, the identification is often delayed for from three to five days. An essential feature of the method is to use a large quantity of blood and dilute it with sufficient bouillon to overcome the bactericidal properties of the blood. Cultures made early in the disease are usually more certain to give a positive reaction than those made later. There is a difficulty in determining the day of the disease, but in those cases in which relapse occurred and the results were positive, they were found on the third, fourth, and fifth days. Previous cultures in these three cases had been negative, so that it may be inferred that a fresh blood infection had taken place. Positive results obtained in these and other cases showed that in the majority of cases of typhoid fever there is an invasion of the blood with bacilli, during the early weeks of the disease. It is not a septicemia, as the bacilli are usually small in number. During the third week, or at any rate about the time the temperature begins to fall, bacilli are no longer obtained in the blood cultures.

The Two-glass Urine Test.—Dowd, J. Henry. *Buffalo Medical Journal*, October, 1901.

This test is one of great importance in urinary diseases, and it has been used in such a variable manner that accurate comparative deductions cannot be drawn from the reports. An important point in its application is to bear in mind that it takes at least two ounces of urine to thoroughly cleanse the anterior urethra. With but few exceptions the two-glass test can be relied upon to furnish positive information of the involvement of the anterior urethra, the posterior urethra, the prostate, bladder, or kidneys.

A thorough understanding of the physiology of urination must be in one's mind in order to fully appreciate the value of the two-glass test. In a perfectly normal condition, urine enters the bladder at an average rate of about two ounces each hour. When the viscus is filled to a certain extent, the retaining power of the internal sphincter gives way and the urine enters the posterior urethra. This occurs about two hours after the bladder has been

emptied. Posterior urethritis would not be so commonly diagnosticated as cystitis if this were kept in mind. The progress of an inflammation of the urethra or the whole urinary tract is more easily studied by the naked-eye appearance of the double-glass urine test than by the microscope.

The following table is given, showing the different findings in the various conditions of the urinary tract, as shown by this test:

Part Involved.	First Glass.	Second Glass.
Anterior urethritis, acute; posterior urethra not involved.	Opaque.	Clear.
Posterior urethra slightly involved.	Opaque.	Clear, or only slight opacity.
Posterior urethra markedly involved.	Opaque.	Opaque, less than first, possibly some blood.
Posterior urethra more marked than anterior.	Opaque, possibly shreds.	Same opacity, no shreds.
Posterior urethritis; anterior urethra nearly normal.	Opaque, possibly prost. plugs and a few shreds.	Opaque, with more comma-like plugs.
Anteroposterior urethritis; prostate involved.	Opaque, some shreds and comma-like plugs.	Opaque, more comma-like plugs than in first.
Anteroposterior urethritis with vesiculitis.	Opaque, shreds or no.	Opaque, but more so than first; pus may drop from meatus at end of urination.
Anteroposterior urethritis with prostatic abscess.	Opaque, shreds or no.	Same opacity, or may be more marked than first; free pus may appear at meatus.
Stricture with anteroposterior urethritis and involvement of prostatic sinuses.	Slight opacity with comma-like plugs and well-marked shreds of firm consistency.	Almost clear, except comma-like plugs.
Acute cystitis, non-tubercular; urethra not involved.	Opacity resembling hard cider; urine, on standing, adheres to bottom of glass in compact mass.	Same opacity, occasionally more marked than first.
Tubercular cystopyelitis.	Opacity of dirty-greenish hue; if much blood present, assumes a dirty red; shreds are often seen.	Same.
Pyelitis, no urethritis, slight cystitis.	Opaque in degree as to pathological condition present; pus will adhere to bottom of glass on standing; may be of a greenish, oily hue.	Same opacity, same phenomena.
All inflammation or new tissue formation in urethra absent.	Clear, excepting possibly phosphates, spermatozoa, bacteria, urates, etc., and after passage of sound washings are free of bloody strings.	Same as first.

A Modification of Neisser's Test for the Diphtheria Bacillus.—Cobbett, L. *Lancet*, vol. clxi, No. 21, p. 1403.

The importance of detecting the "contact" cases of diphtheria makes the examination of cultures from the throat a matter of great

importance in preventing the spread of diphtheria. The diphtheria bacilli are no longer believed to be universally distributed in the throats of healthy people, but are to be found in those who have been exposed to the contagion, but who present no evidence of clinical diphtheria. The only means of identifying these suspects is by culture, and they furnish a number of atypical bacteria, among which the pseudo-bacillus of Hoffmann is prominent.

A modification of Neisser's stain, much more simple in application, and of equal efficacy in determining the true character of the bacilli, is to use a solution of five-per-cent acetic acid, allowing it to run under the cover-slip on which the spread has been stained in the usual manner. If the bacilli are watched while the acid is entering, a blue cloud forms which blots out everything. This lasts for a moment, when the field clears and the diphtheria bacilli are seen, showing the characteristic polar bodies stained in the same way as by Neisser's method, except that they are not brown, but pale blue. The method is applicable to all organisms which are suspected to contain the diphtheria bacillus. Where the typical polar bodies are seen by this method, there is no necessity of using the full Neisser process.

Clinical Significance of the Klebs-Loeffler Bacillus. — RUPP, ADOLPH. *Medical Record*, vol. lx, No. 19, Nov. 9, 1901.

Clinically there are two diphtherias: (*a*) those having Klebs-Loeffler bacilli; (*b*) those in which it is absent. Both forms may develop the same signs and symptoms and have the same complications. The character of the bacillus does not determine the course of the disease, nor is it an element in the prognosis. Diphtheria in which this bacillus is present may be so mild as to simulate a simple tonsillitis, and yet the germ be very virulent. Virulent germs may be found in the throats of healthy people, and they are sometimes associated with other infectious diseases without appreciable influence on the progress and termination of those affections.

The Klebs-Loeffler bacilli vary much in size and shape, and their toxicity does not seem to be dependent upon any of these variations. Their virulence can only be determined by inoculation. The Klebs-Loeffler bacilli are so irregular in form and inconstant in their toxic qualities, as well as so universally distributed, that they are not to be regarded as of primary etiological importance in the pathogenesis of the clinical diphtherias. The assumed etiologic and pathologic supremacy of the Klebs-Loeffler bacillus is largely if not altogether a synthetical demonstration.

The Diagnosis of Biliary Obstruction.—CABOT, R. C. *Medical News*, vol. lxxix, No. 22, p. 844, Nov. 30, 1901.

What is known as Courvoisier's law has been misconstrued by many of the text-books on surgery. In most of the standard works it is said that impaction of a gall-stone in the common duct causes enlargement of the gall-bladder. In an extensive analysis of the literature Courvoisier found that out of 100 cases in which the obstruction was due to causes other than stone, 92 had dilatation of the gall-bladder. What is known as Courvoisier's law may be stated as follows: When the common duct is obstructed by a stone, dilatation of the gall-bladder is rare. When the gall-bladder is obstructed by other causes, dilatation of the gall-bladder is common.

Mayo Robson independently came to the same conclusion, stating that "jaundice with distended gall-bladder is presumptive evidence in favor of malignant disease, but jaundice without distended gall-bladder favors the diagnosis of cholelithiasis."

SURGERY.

Acute Dilatation of the Stomach.—BOX, C. R., and WALLACE, C. S. *Lancet*, vol. clxi, No. 19, p. 1259, Nov. 9, 1901.

Acute Dilatation of the Stomach.—THOMSON, H. C. *Lancet*, vol. clxi, No. 17, p. 1113, Oct. 26, 1901.

Box and Wallace, in 1898, reported to the Clinical Society sixteen cases. In their last communication two additional cases are recorded; in both the extent of the dilatation was determined by a post-mortem examination. In their former communication an effort was made to collect cases in which recovery followed, but this was difficult, as the symptom grouping in these cases is very obscure. They found five instances in which recovery seemed to have taken place, cases in which there was no evidence of pyloric stenosis.

A patient with an ulcerated wound of the knee-joint and inflammation of the cellular tissue had an amputation of the thigh. At the time of the operation he was collapsed, and responded but slightly to intravenous infusion of saline fluid. He died shortly after the operation, and at the post-mortem examination the only visceral abnormality was an enormous distention of the stomach and of the first portion of the duodenum. The stomach contained a little fluid and some odorless gas.

A man 24 years of age was admitted to St. Thomas's Hospital on the third day of an illness which began shortly after violent exercise,

during which he experienced pain in the left side. The physical signs showed a pleuropneumonia. On the fourth day of the disease profuse diarrhea set in, accompanied by vomiting and severe epigastric pain. Saline fluids injected into the subcutaneous tissues caused no reaction, and death occurred eleven days after the commencement of the disease. At the post-mortem examination hepatitis of the lower lobe of the left lung was found. The heart was not dilated, there was no endocarditis, and no excess of pericardial fluid. The stomach was distended, its lower border reaching the level of a line joining the iliac spines. The distention involved the duodenum and a short portion of the jejunum. This shows that acute dilatation cannot be attributed, as it is by some, to spasm of the pylorus. The fact that bile is found in the stomach is an additional point against the theory of pyloric spasm. In some instances the tension of the stomach wall is so great that it vibrates upon the slightest touch. Two other views have a mechanical basis: one, that the duodenum is kinked by the compression of the stomach, and a second, that it is compressed by the mesentery and vessels that cross it. Experiments by the writers show that distention may occlude the duodenum where it crosses the third and ascends by the side of the second lumbar vertebra.

Acute dilatation of the stomach is characterized by its sudden onset, by the vomiting of enormous quantities of fluid, and by severe general symptoms which in most cases end fatally within a few days after the onset of the disease. The condition is infrequently referred to in the literature, and four post-mortem examinations in which this condition was found in the experience of a single operator leads to the belief that, while uncommon, it is not as rare as is believed.

Case 1 was a man 44 years of age, whose stomach symptoms existed for three months before admission to hospital. The stomach was dilated, and extended downward to within an inch of the umbilicus. An indefinite tumor could be felt in the epigastrium. Gastric lavage was performed for the relief of the vomiting, and thirty-eight ounces of fluid was withdrawn. Relief was experienced, and the following day the procedure was repeated. On that afternoon the patient became suddenly worse, there was abdominal pain and hiccough. Early in the evening he vomited eight ounces of thick, dark-brown fluid. Later collapse set in, with subnormal temperature, and cold extremities. There was severe abdominal pain, and the outline of the stomach was easily seen, appearing to cover a greater area than formerly. It was thought at first that there might be a perforation of the stomach. Morphine relieved the

acute pain. The pulse was 120. The lower border of the stomach, which could easily be made out through the thin abdominal walls, had reached the umbilicus. A tympanitic percussion note could be obtained in the left axilla, as high as the fourth rib. During the day the symptoms increased in severity, and death took place on the third day after the development of acute dilatation.

At the post-mortem examination the contents of the abdomen were almost entirely obscured by the dilated stomach, which was distended with gas and contained a considerable quantity of dark-brown fluid. The stomach was cylindrical in shape, the lesser curvature making a sharp turn, while the greater curvature was rounded and reached a point below the level of the iliac crest. There was narrowing of the pyloric orifice.

This was a case of acute dilatation suddenly supervening upon a chronic distention due to stricture of the pylorus. The stomach washing may have contributed to the onset of the acute symptoms.

Case 2 was a man aged 26 years, whose symptoms came on immediately after an exploration of the kidney, in the search for a renal calculus. Vomiting commenced a few hours after the operation and persisted until the time of death, which took place on the fourth

day. The temperature was slightly below normal and the pulse ranged from 120 to 140. There was free urination. At the post-mortem examination the stomach was found to be enormously distended and of cylindrical shape, the lower end being on a level with the iliac crest. The stomach, in addition to the gas, contained a quantity of thick, green fluid. The intestines were collapsed, with the exception of the upper portion of the duodenum. There was no obstruction of the pylorus and no changes were found in the stomach walls. The operation wound, in the region of the right kidney, was in process of healing.

Case 3 was that of a man 40 years of age, whose abdomen was explored to ascertain the condition of the gall-bladder. There were no untoward symptoms until the fifth day after operation, when vomiting set in. The vomiting brought up large quantities of a brownish fluid, the urine became scanty and the temperature subnormal, death taking place on the tenth day after operation. The post-mortem examination showed the stomach greatly distended, having a cylindrical outline. A tumor was found in the head of the pancreas, but it did not press upon the pylorus. There was no obvious dilatation of the stomach at the time of the abdominal exploration.

Case 4 was a woman 24 years of age, admitted to hospital on the second day of an illness, during which she developed lobar pneumonia and pleurisy. The day following her admission there had been no extension of the disease, but the patient suddenly vomited, a symptom which continued for thirty-six hours, during which time the patient became collapsed and finally died. At the post-mortem examination the stomach reached as low as the pubes, and contained, in addition to the gas, thirty-five ounces of dark greenish fluid. When the stomach was emptied it appeared but little larger than normal, its walls being normal. The intestines were collapsed from compression.

Acute dilatation of the stomach may occur without obvious cause, the patient being in usual health. It may occur immediately after a surgical operation which may or may not be connected with the abdomen. In some cases obstruction of the pylorus is found. In cases of great debility the ingestion of a large quantity of poorly masticated food may be an exciting cause.

Among the symptoms of acute dilatation is distention of the abdomen, the enlargement being most pronounced in the lower and left side. The hypochondrium often appears flattened. Vomiting is a constant symptom, and usually large quantities of brownish or

greenish fluid are brought up. The general symptoms are those of collapse, the pulse is small and rapid, the respirations are frequent, and the temperature low.

After death the stomach presents the characteristic bent cylinder, with one limb shorter than the other.

Acute dilatation of the stomach, while more rare than paralytic distention of the intestines, is analogous to it, and probably has a similar origin. The treatment of the recorded cases seems to have been of no avail in checking the distention. The obvious indication seems to be the relief of the stomach by means of a tube, but, unfortunately, this does not seem to have been followed by permanent improvement. Nutriment should be administered by the rectum, and the tendency to collapse combated by hypodermic injections of strychnine. The symptoms seem in part attributable to the enormous quantity of fluid lost, and this should be met by transfusion or the injection of saline infusion into the rectum.

Advance in Surgical Diagnosis by the Roentgen Ray.—LEONARD, C. L. *Bulletin of the Johns Hopkins Hospital*, vol. xii, No. 129, p. 363, December, 1901.

Attention is called to the necessity of clinical observation in interpreting skiagraphs. The Roentgen-ray diagnostician must interpret correctly the data upon which he bases a diagnosis. This is the personal element in an otherwise mechanical method, the correct application of which is based upon normal and pathological anatomy.

The value of this method in the treatment of fractures has not been adequately realized. By it we secure accurate knowledge, which would not be possible by any other method, and that without injury. Pain, which is hidden by an anesthetic in making a physical examination of an injured part, does not prevent the infliction of damage which must appreciably interfere with the restoration of the injured part. Crepitation, and the necessary manipulation to produce it, injure the peritoneum, produce fragments, and increase its oozing.

The accuracy and detail of this method of examination is of great value in directing treatment. An undetected comminution delays repair, and frequently results in non-union. The callus thrown out from a linear fracture will injure the functions of the joint, unless the correct treatment is instituted. The shape and position of the line of fracture direct attention to the difficulties and complications that may attend treatment, and help in avoiding them.

This knowledge aids in reducing the fragments, and in securing coaptation. By it successful reduction and the value of fixation apparatus are readily determined.

In the application of the open method of treating fractures the Roentgen-ray examination is of the utmost importance. When a skiagraph shows that proper reduction cannot be secured, or the fragments cannot be maintained in correct position, the patient should have the facts laid before him, that he may make a choice between imperfect union and an operation.

The value of this method of diagnosis in renal and ureteral calculi cannot be overestimated. With proper technique calculi of very small size can be detected, and a considerable number of cases show that they are relatively more frequent in the ureter than in the pelvis of the kidney. The information secured by such an examination is comprehensive, and it is no longer necessary to open and explore a kidney, to find a calculus in the pelvis of the organ. Its exact situation can now be determined, and the operation directed accurately to its removal.

Hair Tumor Removed from the Stomach. — BRUCE, HERBERT A. *Canadian Practitioner and Review*, vol. xxvi, No. 11, p. 597, November, 1901.

The case was that of a married woman, 26 years of age, the mother of two children. Two months before the birth of her last child a tumor was noted in the abdomen, which caused no symptoms. The attending physician made a diagnosis of twin pregnancy, but after the birth of the child it was found that the tumor remained. A diagnosis was then made of a misplaced spleen. The tumor was hard, freely movable, and could be pushed up under the ribs. No especial discomfort was experienced by the patient when the tumor was moved. There was no nausea, and the appetite was good.

On opening the abdomen in the middle line, the spleen and kidneys were found in their normal position, but there was a large mass free in the stomach. Palpating through the stomach wall the tumor appeared to be composed of two limbs, meeting at an acute angle at the lowermost portion of the greater curvature; that portion extending through to the pyloric end of the stomach felt as if it were jointed. An incision between four and five inches in length was made, and a mass of hair was removed. The tumor was composed of twisted hair, woven together, of a brownish color, of the same shade as that of the patient. The mass was twenty-four inches long; the large portion, at the cardiac end of the stomach, measured six and three-quarters inches in circumference. Approaching the

small end of the tumor there was at first a slight increase in size, and then a fairly regular taper to the small end, where the circumference was less than one and a half inches. Below this it extended into the pylorus and into the duodenum a distance of about six inches, and comprised but a few hairs.

In the literature nineteen cases of hair masses within the stomach are reported. In most of them hair-swallowing as a habit had prevailed for years. The largest quantity of hair removed weighed five pounds and three ounces. Of the nineteen cases, ten were discovered post mortem and nine upon the operating table. In not a single case had a correct diagnosis been made, and none of the surgeons who operated even suspected that there was a foreign body in the stomach. As a rule the diagnosis was splenic or omental tumor, movable kidney, or fecal impaction. The hairs of these "tumors" are the ends of braids or locks that have been bitten or broken off; in only a few cases was the hair of any considerable length.

Suture of the Heart.—VAUGHAN, G. T. *Medical News*, vol. lxxix, No. 23 p. 881, Dec. 7, 1901.

A case is reported of a man 23 years of age who received a stab wound which divided the left fifth costal cartilage close to the sternum. The patient was cold and pulseless. The surface of the skin about the wound was hurriedly cleansed and sufficient ether given to quiet the patient. The external wound was extended above and below to a length of fifteen centimeters. A flap was turned backward and an opening in the pericardium exposed, through which a wound of the left ventricle close to the septum could be seen. The blood spurted from this wound at every contraction of the heart. A hemostatic forceps was introduced, and the edges of the heart wound grasped and rapidly closed by a continuous suture of silk. The pericardium and pleural cavities were emptied of blood. At this point in the operation the heart ceased beating, and no effort at resuscitation was successful.

A table of twenty-six cases of suture of the heart is given. Seventeen died and nine recovered, a mortality of 65.38 per cent. The reported cases show that the wounds of the ventricle are of more frequent occurrence than those of the auricle. In five of the reported cases, either the ventricle was not opened, or this fact was doubtful. Hence the mortality of penetrating wounds of the heart, as shown by the statistics, is 76.93 per cent.

A wound of the heart should be operated on with as little hesita-

tion as a wound of the brain. The mortality is always high, not from the operation, but from the injury. A selection of cases that have survived five or more hours after receiving the wound would give a higher percentage of recovery, but such selection is not to be recommended; all cases of wounds in the region of the heart with grave symptoms should have an exploratory operation. An osteoplastic flap should be formed by dividing the fourth and fifth costal cartilages at their attachment to the sternum, and the ribs about one inch external to their attachment to the cartilage. Such a flap turned upward gives a good view of the pericardium, and it can be easily enlarged if more room is required.

Tetanus Following Aseptic Celiotomy.—Coe, H. C. *American Gynecological and Obstetrical Journal*, vol. xix, No. 6, p. 481, December, 1901.

Attention is called to the rarity with which tetanus develops after abdominal operations; not a single case is to be found in the records of Bellevue Hospital, and none have occurred in the Woman's Hospital (New York) during the past thirteen years.

The patient was operated upon for a double pyosalpinx. There was a history of gonorrheal infection six months before operation. The postoperative conditions were favorable, and there was no temperature, though the patient manifested considerable anxiety and was at times hysterical. On the sixteenth day after operation she complained of sore throat, and the following day there was some trouble in swallowing and the neck felt stiff. On the twenty-fourth day after the operation, while walking, she suddenly felt her legs giving way. On the thirtieth day there was pain in the muscles of the back, and on this day twenty-five cubic centimeters of tetanus antitoxin was injected. The restlessness increased, but the temperature remained normal. The patient died of exhaustion on the thirty-sixth day after the operation and the twentieth after the appearance of the initial symptoms.

A second case was that of an operation for an ovarian cyst, which was completed in forty minutes and presented no special complications. The convalescence was normal. On the ninth day there was stiffness of the right side of the neck. On the tenth day, forty cubic centimeters of antitetanus serum was administered. On the eleventh day there was a severe general convulsion which involved the respiratory muscles, and the patient died.

A second patient, whose case is reported, was operated at the same time, in the same operating-room, and under identical conditions, and did not develop tetanus. Dr. Janeway was of the opinion

that possibly the Croton water that was used in the irrigations might contain tetanus spores, as they were commonly present in the hydrant water of New York. It is possible that the spores might not be destroyed by an hour's boiling.

Treatment of Imperfectly Descended Testicle.—BUCKWELL, R. *Clinical Journal*, vol. xix, No. 6, p. 88, Nov. 27, 1901.

A summary of the results of thirteen cases is given, in which the testicle was brought from the inguinal canal to the scrotum by various methods. The cases were all examined from two to seven years after operation. The results were not very favorable, as in only one case did the gland regain its proper size, and in four cases only was it found in the scrotum. The chief cause of failure is a late operation, when the structures of the cord are shortened and the proper elements of the testicle destroyed.

Manipulation is a method which sometimes succeeds in restoring the testicle to its normal position, particularly if treatment is begun soon after birth and persistently and regularly carried out. Should there be no results after the infant is two years of age, recourse should be had to operation. No attempt should be made to save the testicle if the body and epididymis are widely separated, or if it is necessary to sever all the vessels of the cord to bring the gland into the scrotum. No operation should be performed except castration, if the patient is past the age of puberty. After ten years of age an operation is useless, unless the misplaced testicle is causing some trouble. After this period, as a rule, such fibrous changes have taken place in the organ that its normal function is destroyed.

A Case of Strangulation of the Stomach.—MACKENZIE, HECTOR, and BATTLE, W. H. *Lancet*, vol. clxi, No. 23, p. 1582, Dec. 7, 1901.

A man received a stab wound eight years before coming under observation. At the time it was stated that the lining of the stomach was exposed, and he was laid up for some weeks. Three years ago there was pain in the left upper abdomen, with severe vomiting. The temperature on admission was 96° F., and the pulse hardly perceptible. There was some fulness under the left lower ribs, but no dulness. The chest was well formed, and the note on percussion was resonant, the breath sounds all over being normal. The cardiac dulness began at the fourth rib and did not extend to the right beyond the left edge of the sternum. An incision was made under the left costal margin commencing two inches to the left of the middle line and extending outward four inches. When the abdomen

was opened, the stomach could not be felt at first. The descending colon was found to pass upward beyond the spine, and was traced to an opening in the diaphragm, from which it was easily withdrawn. At the margin of this opening the omentum was adherent, and none of it could be pulled away. After a continued search for the stomach, the pylorus was felt to the inner side of the opening in the diaphragm, and the greater part of the organ, which had passed through the opening, was released. There was a constriction where the stomach was surrounded by the margins of the opening.

Pain and vomiting ceased directly after the operation, but the temperature continued subnormal. At the post-mortem examination the opening in the diaphragm was found to be circular and one and one-fourth inches in diameter. The muscular structure alone was involved. The hernia had no peritoneal sac except that furnished by the omentum. There was no communication between the pleural and peritoneal cavities.

This is one of the few cases of diaphragmatic hernia that have come to operation. In most of the reported cases extreme thirst has been a prominent symptom. This is due to the frequent vomiting and the diminished area for absorption.

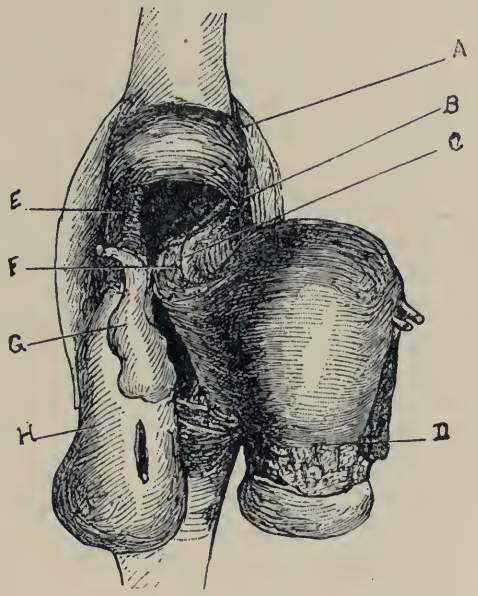
Dermoid Cyst of the Testicle.—Morris, C. C. *St. Louis Medical Review*, vol. xliv, No. 19, p. 326, Nov. 9, 1901.

Dermoid cysts of the testicle are very rare. Kocher, who examined the literature upon the subject, found 114 cases recorded. Senn says that most of the cases of dermoid tumor of the testicle were not such in the correct sense, but were dermoids of the scrotum. The case reported by Morris seems to have been a true dermoid of the testicle. Enlargement of the right testicle had been present since infancy, the child coming under observation at the age of 12 years. Throughout infancy and childhood the boy was healthy, but the right testicle began to enlarge, there being no pain nor tenderness. At the age of 11 the tumor took on a more rapid growth, and then, by reason of its size, caused some discomfort. At the time of the operation the tumor was as large as a goose-egg. It was very firm and had to be divided with a saw. It contained hair in considerable quantity, sebaceous matter, and two teeth.

Anterocolpoceliotomy.—Dührssen, A. *Berliner Klinische Wochenschrift*, vol. xxxviii, No. 44, p. 1104, Nov. 4, 1901.

Conservative surgery, in the treatment of pelvic conditions, is now recognized to be of the greatest importance. It should be the

effort of the surgeon to leave at least a portion of the ovaries, tubes, and uterus, that the sexual character of the individual may be preserved. By many gynecologists this is only thought to be possible by a ventral celiotomy. For the past eight years the writer has been exposing the pelvic organs by an incision in the anterior wall of the vagina. It is claimed that this latter method permits of the same accuracy in operation as when the incision is made in the middle line, above the pubes. The adnexa are by this method reached with the same precision that they are by the higher incision, and abdominal drainage is facilitated by the low position of the incision.



A, Labium majus; B, left ovarian ligament; C, left tube; D, lower border of posterior uterine reflection of the peritoneum; E, right suspensory ligament; F, left ovary; G, right pyosalpinx; H, right ovarian cyst.

Sterilization of Catheters.—NANCREDE, C. B., and HUTCHINGS, W. H. The *Medical News*, vol. lxxix, No. 21, p. 806, Nov. 23, 1901.

This is a preliminary note on the sterilization of catheters, based upon a bacteriological study. An infected soft-rubber catheter cannot be sterilized by boiling under four and a half minutes. Mechanical cleansing from dried blood, mucus, or pus makes the amount of time required in sterilization shorter and the process much more effective. Elastic (English web) catheters and those of soft rubber can be repeatedly boiled for five minutes, without roughing their

surface and without diminishing their elasticity or strength. Immersion in a 1-to-2000 mercuric chloride solution does not sterilize any variety of catheter which has become infected; it at best only inhibits the growth of the germs. Chemical sterilization should never be employed for catheters which are to be retained in the bladder for any length of time, unless they have had a prolonged exposure to the bactericidal agent. If corrosive sublimate is employed for sterilization, it must be a concentrated solution, the exposure being for a long time; no mere washing with any chemical solution is sufficient for an infected instrument. Formalin will sterilize infected catheters in twenty-four hours.

THERAPEUTICS.

The Treatment of Croupous Pneumonia. — WILSON, JAMES C. *Philadelphia Medical Journal*, vol. viii, No. 18, p. 734, Nov. 2, 1901.

The varying mortality in different series of cases makes any comparison in the results of treatment valueless. Referring to Aufrecht's advocacy of quinine, he criticizes his statistics, which extend over a period of but ten years. Under the quinine treatment the mortality fell to 8 per cent, although in former years it had fluctuated between 9 and 25 per cent. Croupous pneumonia, more than any other disease, demands a large series of cases to establish the efficiency of any line of treatment. This disease occurs under varying conditions, each of which modifies the course of the attack and the mortality. The efficacy of any treatment would have to be based upon a large series of cases under similar conditions of age, occupation, and previous health. Such figures are not available at this time.

The digitalis treatment of Petrescu has been extensively followed in this country. The originator of this treatment published a series of 1192 cases with a mortality of 2.66 per cent. Comparing these cases with 500 taken from the records of the Pennsylvania Hospital, which showed a mortality under the expectant treatment of 25 per cent, there is an apparent enormous lessening of the mortality under the digitalis treatment. The observations of Petrescu were conducted in a hospital on selected cases—young, strong men in good health, living under proper hygienic conditions and free from alcoholism. The cases of the Pennsylvania Hospital occurred in persons of that class who seek such an institution from absolute necessity, many absolutely destitute, others overworked, badly nourished, some

in previous poor health, aged tramps addicted to alcohol. Of thirty-four of these cases known to have been drunkards, twenty-three died, a mortality of 67 per cent. An analysis of these cases further shows that with advancing age there was a rapid augmentation in the mortality. It is evident that a comparison of such series of cases is valueless in drawing any deduction as to treatment. Aufrecht in 377 cases of pneumonia, all hospital patients, but none of them more than 20 years of age, had a mortality of 2.64 per cent. All of these cases were treated upon the expectant plan.

The writer's experience with the antipneumococcus serum was anything but satisfactory. In all, thirty-six cases were treated, the mortality being 28 per cent. His experience with the treatment is such that he is not encouraged to continue. Hydrotherapy has also not been satisfactory; neither the effects upon the course of the disease nor upon mortality were such as to justify its continuance.

The plan pursued in the writer's service in the German Hospital in Philadelphia is to place the patient upon a light diet consisting of gruels, water, and milk. Water is given in abundance in small quantities, frequently repeated. Under ordinary circumstances the patient is sponged in the morning with water, the temperature of which is regulated by his sensations. If the temperature exceeds 104° F. cold sponging may be repeated at intervals of two to three hours. Early in the disease two or three well filled ice-bags are applied to the affected side. These relieve pain and add to the patient's comfort. They have a slight effect in reducing temperature, but none whatever upon the extension of the exudate or the course of the disease. Alcohol is given in the majority of cases, the amount usually not exceeding four or six ounces of whiskey in twenty-four hours; larger quantities are given to those accustomed to its use. A calomel purge is commonly administered at the beginning of treatment. Pain is relieved by morphine hypodermically, and Dover's powder in two- or three-grain doses every two or three hours, sufficient to make the patient comfortable. Toward the close of the attack the Dover's powder is given with diminishing frequency. Expectorants are rarely employed. Aconite and veratrum viride are never given, and digitalis only in response to particular indications. In some cases strophanthus answers a better purpose. Strychnine is given as a cardiac stimulant, and nitroglycerin for the relief of the right heart. These measures failing, with increasing signs of failure of the right heart associated with mucous râles and cyanosis, venesection is called for. If there is pulmonary edema, atropine is given hypodermically, and sometimes it seems to avert a

fatal issue. Dyspnea indicates oxygen, but care should be taken to have it freely diluted with air. Delirium is usually controlled by the Dover's powder, and the patient may be benefited by the application of an ice-cap. Neither poultices nor cotton jackets are allowed. The patients wear moderately heavy, loose-fitting merino undershirts. Blisters are used only in cases of delayed resolution. At the crisis the patient is carefully watched, and stimulants are sometimes necessary.

The statistics of the German Hospital under this plan of treatment are not satisfactory, the figures for the last five years showing a mortality of 36 per cent in a series of 188 cases. On the occasions in which this symptomatic treatment has been abandoned for cold bathing and serum therapy, the results were even less favorable. The figures show the intractable character of the cases, the high mortality of the disease in a general hospital, and the great variation in the mortality in short series of cases in different years.

Ocular Massage in Retinal Embolism.—WURDEMANN, H. V. *Annals of Ophthalmology*, vol. x, No. 4, p. 582, October, 1901.

Two cases are reported in which ocular massage was employed with success. The first case was that of a woman 29 years of age, who experienced a total loss of vision in the right eye, which came on shortly after the menstrual period. The general health of the patient was excellent. The external examination of the eye revealed nothing abnormal. The ophthalmoscope showed a typical embolism of the central retinal artery, the veins being engorged and none of the arteries carrying blood. The macula showed the characteristic red spot, and there was edema of the retina. Deep massage was used, this consisting of placing the ball of the operator's thumb upon the upper lid of the closed eye and forcibly, with slow movement, exerting pressure upon the eyeball for two minutes. After the first treatment the ophthalmoscopic examination showed that the arteries were carrying blood, that the veins were less engorged, and that the eye could detect the difference between light and dark—a slight improvement in vision. The massage treatments were given twice daily, in connection with pilocarpine, saline cathartics, rest in bed, and hot compresses. This treatment was continued for six days, when the patient was sent home, the ocular massage being continued by the family physician, and the general treatment was stopped. Sixteen days after treatment began, fingers could be counted at a distance of two meters. At this time a central scotoma, extending ten degrees around the fixation point, was found. One

month after the beginning of treatment there was normal acuity of vision, and only slight traces of the extensive scotoma were to be found.

Stypticin in Uterine Hemorrhage.—Boldt, H. J. *Merck's Archives*, vol. iii, No. 11, p. 421, November, 1901.

Stypticin is the hydrochlorate of cotarnin. It occurs as a crystalline yellow powder, is of bitter taste, and is freely soluble in water. When used with due regard to its proper limitations, it is useful in uterine hemorrhages. In cases of profuse and irregular menstruation, without appreciable pathological changes in the pelvic organs, it is valuable. It should be administered in doses of three-quarters of a grain, three times daily, and may be continued for two or three months. In cases of hemorrhage associated with dysmenorrhea, the pain may sometimes be removed, though in most cases it is not affected. In cases in which portions of the decidua are retained, it will not check the bleeding until they are removed, but in the cases in which a curettement does not lessen the hemorrhage, stypticin is valuable. It is useful in the atypical hemorrhages of the climacteric, those which present no apparent pathological changes. When the bleeding is associated with inflammation of the uterine mucosa, this or any other drug taken internally will be of no benefit. In a simple endometritis it may be of use, but in endometritis fungosa it is valueless. In a few instances hemorrhages during pregnancy were relieved, and in no case was uterine contraction caused. It is of little use in fibroid and malignant neoplasms. If a rapid action of the drug is required, it is best administered subcutaneously. Two to three grains is injected into the buttocks and repeated in from four to six hours. Two injections failing to give the desired result, the remedy may be given by the mouth, either in capsules or in tablets. Five grains may be given subcutaneously, without causing unpleasant symptoms.

The Roentgen Rays in Sarcoma.—Beck, Carl. *New York Medical Journal*, vol. lxxiv, No. 20, p. 906, Nov. 16, 1901.

A few cases of the successful management of superficial sarcoma by the *x*-ray have been reported. Beck records a case in which the disease was inhibited, but the trouble had advanced so far that a cure was hardly possible. The tumor in this patient began on the ankle, seeming to have its origin in a mole which had existed for about fifteen years. At the time the patient was seen the growth was moderately hard and of a light-gray color, and a lymphatic

gland was enlarged in the groin. The first diagnosis was that of lymphosarcoma. An amputation was advised. So radical an operation was declined by the patient, and the tumor was extirpated, the bottom of the operation wound showing what appeared to be healthy periosteum. The microscopical examination confirmed the diagnosis of melanosarcoma. Six weeks later the patient returned to hospital, the site of the original operation being encircled by several bluish-black nodules, and the gland in the groin had grown to the size of a goose-egg. A second operation was performed, followed by early recurrence. The patient would now have submitted to amputation, but it was too late, owing to the extensive glandular involvement. At this time the *x*-rays were used, the exposures lasting from ten to forty-five minutes. The results were immediate and quite gratifying. At the end of six weeks there had been no relapse, and a number of the metastatic nodules in the calf disappeared. The inguinal tumor remained. While an early fatal issue is to be looked for, yet the result achieved by the *x*-rays in the treatment of such an exceedingly malignant growth makes it worthy of report, and points to what might be done if the treatment were begun earlier.

Sulphur in the Treatment of Dysentery.—Richmond, G. E. *Lancet*, vol. clxi, No. 21, p. 1406.

A number of cases of obstinate diarrhea observed in South Africa, which did not yield to the ipecac treatment, were successfully managed by the administration of sulphur. The latter treatment was found to be by far the most efficient, and was not attended by those disagreeable symptoms which sometimes follow the administration of ipecac. There was not the same tendency to relapse, with that alternation of diarrhea and constipation, which is so often observed. In all cases meat was excluded, and a farinaceous diet given from the first. Sublimed sulphur in twenty-grain doses was combined with five grains of Dover's powder, given every four hours. With the administration of the first powder the general condition of the patient improved, the diarrhea and tenesmus diminished, and the blood and mucus disappeared from the discharge within two days. The writer's experience included eleven acute and ten chronic cases. The precise mode of action in these cases has not been determined, but it is reasonable to suppose that there is formed in the bowels sulphuretted hydrogen or sulphurous acid, which inhibits the growth of microörganisms.

In these cases the ameba was carefully searched for, but was never found. The writer believes that there is a specific bacillus present in this class of cases, analogous to that described by Shiga.

Hydrobromate of Hyoscine in Chorea. — EWING, W. B. *Pennsylvania Medical Journal*, vol. v, No. 2, p. 73, November, 1901.

The quieting effects of hydrobromate of hyoscine in maniacal excitement has led the writer to employ it in chorea. The first case was that of a very severe chorea occurring in a man 18 years of age. The disease began without prodromata and developed very rapidly. Within the first three days the movements were so violent that the patient was confined to the bed and had to be placed between mattresses to prevent injury. The muscles of the face were involved. The hydrobromate of hyoscine was given hypodermically, twice daily, and combined with twenty grains of chloral and a similar quantity of ammonium bromide. At the end of five days involuntary movements ceased. Hydrobromate of hyoscine has been given in twenty cases of more or less severity. In some of the cases it has been combined with Fowler's solution, but in others it has been given alone. It is given in doses of $\frac{1}{200}$ to $\frac{1}{50}$ of a grain, according to the age and the severity of the attack. In some cases it was found that the hyoscine was ineffectual if given by the mouth, even in those in whom the digestive functions seemed to be normal.

The Internal Administration of Suprarenal Extract in the Treatment of Hemorrhage. — FLOERSHEIM, S. *Medical News*, vol. lxxx, No. 1, p. 17, Jan. 4, 1902.

No other remedy gives such prompt results in the treatment of hemorrhages as desiccated suprarenal. A short history of twenty-one cases of hemoptysis is given, in all of which the hemorrhage promptly ceased or was markedly improved by the administration of suprarenal. Twenty-three cases of uterine hemorrhages are reported, in which the drug was employed with marked improvement in this symptom. A case of hematemesis occurring in a man 40 years of age, which was complicated by appendicitis and by malaria of the tertian type, was markedly improved under the drug. In this case the usual methods have been employed for about ten hours, with no decrease of the hemorrhage, but within fifteen minutes after the administration of the suprarenal extract the hemorrhage was markedly lessened, and within three hours it had ceased entirely.

The Syringe in Tonsillitis. — MEYER, JOSEPH. The *Brooklyn Medical Journal*, October, 1901.

The author says that he has substituted for other treatment cleansing the lacunæ of the tonsil by syringing with a warm bichloride solution of a strength of 1 : 1000. This is employed in the initial

stage. Formerly he treated these cases by removing the contents of the crypts and then drying them with a cotton probe. He now employs a simple syringe of the laryngeal type, holding from one-fourth to one-half ounce of fluid. In seven cases that he has had an opportunity of seeing after the application of the treatment, it was found that the inflammation was aborted. The anatomical arrangement of the crypts admits of their being readily cleansed in this way. Many of them communicate with each other. The nozzle of the syringe is introduced deeply into the crypt. Relief is often immediate, especially where the crypts have been filled for some time and the cheesy matter has acted as a foreign body.

Beer in Acute Vomiting.—Kolipinski, Louis. The *Medical News*, Oct. 5, 1901.

Acute vomiting is frequent in abdominal and pelvic disease and in some nervous disorders and acute infections. At times this symptom is very unmanageable. His long experience in the use of lager beer as a remedy in such cases leads him to recommend it. The best effects were noted in women who were not habitual users of alcoholics. Of the different varieties of lager beer the dark is preferable. Good results are obtained from small doses, especially where there are attacks of nausea, bilious vomiting, with vertigo. In such cases a wineglassful of beer, repeated every hour, will soothe the disturbed organ and give a night of refreshing sleep.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Hypodermoclysis in Pediatric Practice. — Hollopeter, W. C. *Philadelphia Medical Journal*, vol. viii, No. 23, p. 1003, Dec. 7, 1901.

The value of hypodermoclysis in surgical work in adults is amply attested. Its use in children has been neglected, but the writer's experience shows that it is of merit if used in properly selected cases. It is a method that requires some little care in the technique. The fluid should be sterile and of a proper temperature; if too hot it may cause an abscess, and if too cold the patient is shocked. It should not be introduced in too great quantity, or it may exceed the capacity of the patient to eliminate. The most satisfactory method is to use an old-fashioned, large antitoxin syringe, which holds about two ounces. Such a syringe, after being sterilized by boiling, is filled with normal saline solution of the proper temperature, and the fluid injected into the inner surface of the thighs or the flanks.

Perhaps the best place of all is on the outer aspect of the lower extremities near the great trochanter, as here the skin is least sensitive. The surface of the skin may be first numbed by the application of ice, and sometimes by spraying with ether. At least five minutes should be employed in injecting two ounces of the solution. A gravity apparatus is not satisfactory, as the time consumed is considerable and the temperature of the fluid is lowered.

In cases of wasting sickness where the body fluids are much diminished there is a rapid absorption of these injections. In others, such as acute nephritis, where elimination is defective, the quantity of the blood is increased, and in these cases a glycerin enema may be of use in diminishing the water of the blood. The quantity of fluid injected in young children has usually been too large; it is surprising what good results can often be obtained from one or two ounces. The conditions in which this treatment is most useful are those of anuria in early adult life and in the various forms of uremic coma, the operative diseases, shock, depression following acute febrile disorders, and the atrophy following malnutrition.

Intra-uterine Rickets.—ABBOTT, F. C. *Pediatrics*, vol. xii, No. 11, p. 400, Dec. 1, 1901.

The patient was a girl, 14 months old when first admitted to the hospital. At the time she was undersized and poorly developed, had a large cranium, with prominent eyes, toothless jaws, and deformed limbs. The skull, as a whole, was not typical of rickets. The anterior fontanel was widely open. The deformities had existed from birth, and the peculiar curve of the thighs was characteristic of the position assumed *in utero*. The right leg had a curve with its concavity forward and outward. The curve of the left leg was the opposite of this, with the convexity forward and inward, so that it lay across and fitted over the opposite leg. The bones were soft and malleable to an extreme degree. The child was one of twins. The mother stated that the girl's legs were doubled in the same way at the time of birth. The boy twin was similarly affected, though to a less degree.

A microscopic examination of the bones taken from the child that died showed the typical rachitic changes. From the fact that the child was born with these peculiar bone deformities, the writer assumes that there must have been a development of the disease before birth; hence this and a few other cases that have been reported strongly support the view that intra-uterine rickets is a possibility.

Stricture of the Urethra in a Girl. — TUCKERMAN, L. B. *Cleveland Medical Gazette*, vol. xvii, No. 2, p. 65, December, 1901.

A girl five years of age, undersized, was first seen February 28, 1899. The family history was negative. The patient had suffered from constipation, and enuresis had existed since early infancy. A fissure running from the anterior border of the anus to the fourchette and an incarcerated clitoris were relieved by operation. In April, 1899, the patient was suddenly taken with severe pains in the loins, and dysuria accompanied by hematuria. The localization of the pains upon the right side suggested renal calculus. The bladder was distended, reaching as high as the umbilicus. The passage of a catheter was followed by the discharge of a pint of bloody urine. It was noted that there was considerable resistance to the passage of the catheter. A few days after these symptoms the blood disappeared from the urine, but there remained a cloudy urine, containing pus cells and bacteria. With voluntary micturition it was noted that there was residual urine. Under urotropin and alkaline diuretics the urine cleared, but never wholly. The urethra was dilated and the bladder emptied by the catheter every three or four days. Under this treatment the patient improved, but the residual urine never fell below two and one-half ounces, which, if the catheterization was omitted for a week, would rise to four ounces. Some fourteen months after beginning the treatment death took place suddenly, following some indefinite feverish symptoms.

A post-mortem examination showed a bladder with thickened walls, with a small cavity at the fundus containing pus. Both ureters were dilated irregularly throughout their whole extent. The kidney pelves were dilated.

Prevention of Asphyxia in Breech Presentation. — ORD, G. W. *The Lancet*, Sept. 21, 1901.

The author reports what he at first thought was an entirely original method of saving a child's life when threatened with asphyxia due to pressure upon the cord. He was delivering a breech presentation; the body of the child had been born, when there occurred the usual hitch, and the head could not be advanced. For a few moments pulsation in the cord was felt, and then it ceased. He happened to have a male silver catheter in his obstetric bag, which was passed into the child's mouth. The child cried down the catheter, the chest expanded, and the threatened asphyxia was avoided. A few minutes later a female silver catheter was introduced to afford an additional supply of air. Shortly after-

ward the head was born. A subsequent examination of Playfair's Midwifery showed him that the method had been used before, but it is pronounced by Playfair to be unreliable. In the case under consideration the results were satisfactory.

In the same issue of *The Lancet* is a letter from Edwin Smith in which he proposes that asphyxia in cases of after-coming head be prevented by the introduction of a flexible tube in the mouth of the child. He suggests the addition to the obstetric bag of a soft metal tube equal in size to a No. 8 or a No. 9 catheter, and covered upon one end with an inch or so of rubber tubing to avoid damage to the soft parts of the child.

Tubal Pregnancy with Double Pyosalpinx. — HARE, C. H. *Boston Medical and Surgical Journal*, vol. cxlv, No. 26, p. 707, Dec. 26, 1901.

The case reported is that of a woman 26 years of age, whose menstrual history was normal. Flowing began January 18, and continued almost daily until March 1. The hemorrhage caused marked pallor and anemia. The general symptoms were those of an ordinary pelvic inflammation. The uterine canal was three and three-fourths inches in depth. A curettement caused free bleeding, but very little detritus was removed. At this examination a diagnosis of double salpingitis was made, and an operation was undertaken. When the abdominal cavity was opened it was found to contain a pint of bright blood. The fundus, tubes, and ovaries were firmly adherent to the surrounding structures. The ovaries were enlarged, containing small cysts. The left Fallopian tube was about three-quarters of an inch in diameter, and pus escaped from its fimbriated extremity. There was hemorrhage from the right tube, which was also enlarged. Both tubes were removed and the ovaries resected. The appendix being involved in the adhesions, it was freed and removed. Some days after operation the patient died as a result of pulmonary embolus. A tubal pregnancy was found in the fimbriated end of the right tube, which it is thought preceded the infection and pus formation in this tube. The pus pocket was on the uterine side of the pregnancy.

The Treatment of Raw Peritoneal Surfaces.—WEBSTER, J. CLARENCE. *Chicago Medical Recorder*, vol. xxi, No. 6, p. 394, December, 1901.

The present practice in abdominal surgery requires that all denuded surfaces of the abdominal cavity should be so far as possible obliterated by suture, as this is the only means of avoiding adhesions and intestinal obstruction. Small patches on the parietal peritoneum, the bladder, and the back of the broad ligament, may

be covered by loosening the peritoneum and bringing the edges together with catgut. Similar surfaces on a mesentery may be closed by continuous suture. Omentum which has been freed from adhesions should never be left free. If small, they should be covered with neighboring healthy omentum, and if extensive they should be ligated and removed, the stumps being covered with peritoneum. Raw surfaces on the intestine may be covered by a continuous catgut suture when they are of small size; when large, a detached flap of the parietal peritoneum may be used to cover them. In cases in which the raw surfaces are extensive and it is difficult to cover them, the actual cautery, producing a charred surface, will sometimes prevent adhesion.

Torsion of Both Pedicles in Double Pyosalpinx.— WILLCOMBE, W. L. *Lancet*, vol. clxi, No. 23, p. 1584, Dec. 7, 1901.

An unmarried woman, 23 years of age, came under observation presenting two swellings, one in the right iliac region extending well above the umbilicus, and the other of the size of a half orange just rising from the pelvis. A rectal examination showed that these swellings bulged into the pelvis. An operation showed a sausage-like tumor, dark in color and about three inches in length, occupying the right side of the pelvis. On the left side and rising into the abdomen was a cystic swelling of a yellowish-pink color, with a few adhesions to the sigmoid. The latter was found to be a dilated tube eleven inches in circumference, with two complete twists of the pedicle from left to right. The interesting points in reference to the case are the continuance in menstruation in spite of the practical destruction of one ovary and both tubes.

FORENSIC MEDICINE.

Medical Examiner and Statements as to Health.—*Journal of the American Medical Association*, vol. xxxvii, No. 19, p. 1273, Nov. 9, 1901.

The Iowa code provides that the report of a life insurance examiner shall be final as regards the health of an applicant at the time insurance is sought, and the company is estopped from setting up a claim of defect in the examination. In a recent decision (Peterson *vs.* Des Moines Life Association) it was held that the medical examiner or physician contemplated in this section is the person who examines the applicant and determines his condition of health. It may be customary for an insurance company to have a

medical director who revises the medical examination, yet the person contemplated in the Iowa code is evidently the one who made the personal examination of the applicant. It is further held by the Supreme Court that there may be a breach of warranty in matters not relating to the health of the assured which would vitiate a policy. Where the warranties relate to the health of the insured, the company is estopped from showing their falsity excepting where fraud or deceit is used to procure the report of the medical examiner. The court further holds that the estoppel applies to the condition of the health of the assured prior to the time of the examination. In other words, it relates to all matters inquired about so far as they bear on the health of the applicant, whether they refer to the time when it is issued or not. The ultimate question is, whether the applicant is a suitable person to accept for life insurance.

The decision is of little general value, as it merely defines a statement in the Iowa code; but it is in line with a tendency which courts have to construe statements of applicants for life insurance relating to their physical health as mere assertions of what they know or may be presumed to know regarding their previous health, and not as warranties.

Gangrene from Carbolic Acid.—SHELDON, J. G. *Medical Record*, vol. lx, No. 20, p. 773, Nov. 16, 1901.

A colored man, 37 years of age, eight days before coming under observation, had been given a dilute solution of carbolic acid, which was to be applied to a sore upon the *right* foot. Before making the application he accidentally spilled some of the carbolic acid on the *left* foot, but did not put any on the right. All went well for a period of five days, when the left foot began to feel numb. At the time of admission the left toes and foot as far as the mediotarsal joint were gangrenous. The ankle was edematous, and no line of demarcation was apparent. The heart and blood-vessels were normal, and the urine was negative. An amputation was performed at the middle of the leg and was followed by an extension of a moist gangrene, which in two days reached the knee. The second amputation was then made through the middle third of the thigh. The stump from the second amputation was examined for evidence of infection and pus, but none was found. The vessels and nerves above the site of the gangrene appeared to be normal.

This case is one of considerable interest. The reporter doubts the possibility of such extensive progressive gangrene resulting from a single application of a dilute solution of carbolic acid. No other

explanation is in sight, as the amputated stump was examined, and there was no lesion of the arteries and apparently no infection. It has been generally held that the gangrene resulting from carbolic acid is limited to the part to which it is applied—*i.e.*, it is not progressive, as it was in this case.

A Fatal Case of Acetanilid Poisoning.—Brown, P. K. The *American Journal of the Medical Sciences*, vol. cxxii, No. 7, p. 770, December, 1901.

The patient, 37 years of age, had the day before admission to the hospital taken one drachm of acetanilid divided into six powders, for headache. The pulse was 78, the temperature 100.2°. There was slight jaundice and extreme cyanosis of the lips and nails, the respirations were shallow, there was a slight cough, but a fairly strong heart action. The gums were bluish. The urine, amounting to 300 cubic centimeters, was strongly alkaline and of a deep red color, nearly black; there were a few granular casts. The second day after admission to the hospital there was complete suppression of the urine. The peculiar dark color of the urine was found to be due to hematoporphyrin, which was identified chemically and by spectroscopic examination. Notwithstanding the utmost effort to maintain the vitality of the patient, he died six days after admission. During the stay in the hospital he was slightly delirious, and the pupilary reactions were quite sluggish. The reflexes were exaggerated for a few days, and then gradually disappeared. During the last few days of the patient's life the temperature was subnormal, measuring 95.5° in the rectum. On the fourth day of the illness, the second in the hospital, examination of the blood showed extensive changes. From the fifth to the eighth day the hemoglobin fell from 40 to 32 per cent, the erythrocytes from 2,200,000 to 1,166,000. The leucocytes were persistently between 60,000 and 70,000, and the nucleated reds were slightly above 20,000.

Nutmeg Poisoning.—Hinman, E. E. *Albany Medical Annals*, vol. xxii, No. 12, p. 669, December, 1901.

The patient, aged 36, had eaten four or five whole nutmegs for the purpose of bringing on abortion. When first seen the woman was pale, the pulse 150, feeble and irregular. The pupils did not respond to light or accommodation. The respirations were 23 and shallow. There was a feeling of constriction, and the throat and mouth were dry. There was vertigo, and numbness of the legs and hands. The ocular symptoms were peculiar: all objects appeared to be distant, and as she looked at objects near by they quickly

receded. Objects in the left half of the field of vision appeared to have a chocolate-brown color, while those on the opposite side were normal. Sounds appeared to be distant. There was a tendency to pass into a dreamy sleep with the eyes wide open. She would suddenly stop speaking for a moment, lie perfectly still, and then resume the conversation, remarking that she had been asleep and had dreamed. Application of stimulants restored the circulation, and in a few hours the patient was out of danger.

A number of cases are reported in the literature, and in the most of them there was prostration with partial or complete coma. Vertigo, delirium, hallucinations of sight, with the rapid, feeble pulse and free urination, were the leading symptoms. In five of the reported cases nutmegs were taken to produce abortion, and in every case without accomplishing the desired result.

The Sensation Produced by the Passage of a Strong Electric Current.—*Lancet*, vol. clxi, No. 21, p. 1425, Nov. 23, 1901.

A correspondent writes of a recent accident which occurred to Andre Broca, who was experimenting with a Ruhmkorff coil and received a shock from the powerful current. He had in each hand a large electrode, to which circumstance he attributed his escape from burns. He was thrown violently to the ground, and had a sensation as though his heart had ceased to beat. He tried to call his assistant to switch off the current, but could only make an inarticulate noise. He was at full length on the floor, and felt no sensation in his hands or arms. The walls of the room appeared of a green color and as if they were leaning to the right. When the current was turned off he was assisted to rise, and found that he could walk, but both arms were paralyzed. He felt as though he had only a head and two legs. There was anesthesia of the arms and hyperesthesia of the fingers. On touching a piece of metal he felt a sensation of extreme cold. Within a quarter of an hour he could move his fingers and was able to write slowly. On reaching his home he was able to walk slowly up five flights of stairs. Some hours later he had a violent cardiac palpitation, but after two days felt well. It is noteworthy that after receiving the shock he retained consciousness.

The Right of Recovery for Operation.—*Journal of the American Medical Association*, vol. xxxvii, No. 19, Nov. 9, 1901, p. 1272.

The Second Appellate Division of the Supreme Court of New York has affirmed the decision rendered in the lower court of a verdict in favor of a physician, for $275. The circumstances which led

to the suit were as follows: A physician examined a woman and stated that she was suffering from a trouble which required a surgical operation, and he agreed with the husband to perform it for $75. Upon a second examination it was found that the first diagnosis was erroneous, and that a much more severe and extensive operation would be required, but nothing was said about increased compensation. The facts showed that the severer operation was performed, it requiring the presence of four assistants and a trained nurse, and an attendance extending over from two to three weeks. It was held that the judgment of $275 was a proper recovery, under the circumstances. Another part of the decision relates to the testimony of expert witnesses as to the value of medical services. It was held that the plaintiff was not confined to the hypothetical questions, but the experts were entitled to give their opinions upon what they knew of the value of the services.

Poisoning with Oil of Cedar.—CLEGG. *Philadelphia Medical Journal*, vol. viii, No. 22, p. 964, Nov. 30, 1901.

A woman took about ninety minims of oil of cedar. She was seen thirty minutes later, at which time she was comatose, having violent epileptiform convulsions occurring about every ten minutes. The pulse during the intervals between the convulsions was full and slow, respiration was hurried and irregular, the face was flushed and extremities cold, pupils slightly dilated, not reacting to light. There was a pungent odor of the breath which resembled oil of cedar. An emetic was administered and the stomach washed out. During the next twelve hours the patient improved rapidly. The fecal evacuations contained oil of cedar. There was more or less prostration, which continued for three days. The oil was administered for the purpose of causing an abortion, the patient being four months advanced in pregnancy. There was no effect on the uterus.

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

Books for review, exchanges, and all matters relating to the editorial management should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

All communications relating to the business management of MEDICINE should be addressed to William M. Warren, Publisher, Detroit, Mich.

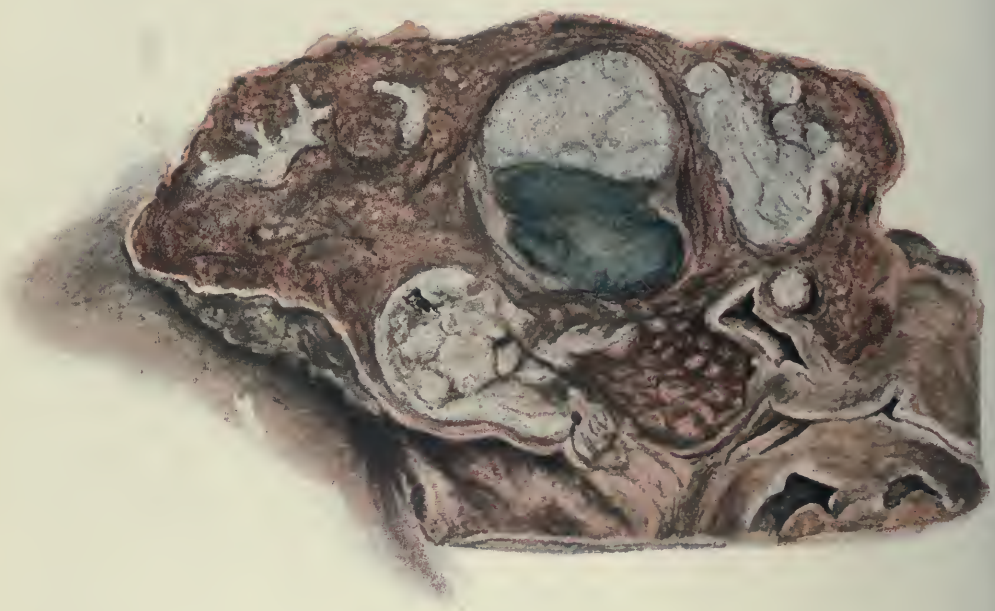


FIG. 1.—Adenocarcinoma of the liver, with a larger carcinomatous nodule, one-half of which is deeply stained with bile. (Painted by Dr. F. H. Brandt.)

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ORIGINAL ARTICLES.

ETIOLOGY OF CARCINOMA AND AUTOIMPLANTATION OF CARCINOMA CELLS INTO THE WALLS OF THE STOMACH AND INTO THE LUNG.

BY GUSTAV FÜTTERER, M.D.,
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Study of the etiology of carcinoma raises several questions: (*a*) Can mere displacement of normal epithelial cells into the intermediary apparatus of nutrition lead to the formation of carcinoma? (*b*) Is it necessary that the normal epithelial cells undergo change before they grow into the deeper tissues, and there multiply? (*c*) Are there elements from without which under ordinary circumstances are no part of epithelial cells, but are needed for epithelial cells to grow into deeper tissues, and there multiply?

The first possibility cannot be denied *a priori*. Carcinoma has developed in parts where (for instance a trocar had been forced through the skin) it seems not entirely improbable that carcinoma could result from displaced normal epithelial cells. Were this true it would be possible to produce carcinoma by experimental implantation of epithelial cells. Such implantations have been made by a number of investigators, but positive results have not been reached. Lengemann[1] sometimes saw karyokinesis in transplanted epithelial cells, but in a short time the cells all perished. I have in the course of the last five years made many implantations with no results. Yet I am not convinced that positive results may not be expected, although this seems far from probable. Lack[2] it is true has seen developments of nodules in the abdominal cavity on the mesentery, diaphragm, and pleura in a rabbit from the cells scraped off the cut surface of an ovary and placed in the abdominal cavity. This, however, is but a single positive observation, which needs corroboration and variation of method and material. My own experiments were

all unsuccessful, and have been elsewhere reported (Fütterer:[3] Ueber die Aetiologie des Carcinoms, etc., Wiesbaden, 1901). Normal epithelial cells suddenly transplanted into the intermediary apparatus of nutrition cannot thrive where they are closely surrounded by blood capillaries, but suspended in serous fluid that causes them to degenerate and break down.

As to the second possibility: Epithelial cells which have long been exposed and have become adjusted to the disorders of circulation, such as moderate edema and chronic hyperemia, are probably able to live and proliferate in the deeper tissues after they have once entered them, either actively by ingrowth or passively through different mechanic influences. In carcinoma the ingrowth of epithelial cells goes hand in hand with a sprouting of blood-vessels, which grow in with them, and that explains the local spreading of carcinoma, which is as certain to occur as the development of metastases is uncertain. The writer urges further experiments with normal epithelial cells which have been changed by chronic circulatory disturbances. An experiment of that kind, performed by himself on the stomach of a rabbit, was successful to a high degree. The experiment referred to has been described in the writer's monograph to which reference has already been made.

In the third possibility, the implantation of epithelial cells, with changes unknown to us, which may even involve the enclosure of foreign elements that are not a part of the cells, but have invaded them, such as parasites, we have to operate with carcinoma cells. Successful transplantations of carcinoma cells from man to animal have been made by Langenbeck,[4] Follin,[5] Francotte and DeRichter,[6] Boinet,[7] Maget,[8] Bose and Vedel,[9] Firket,[10] Weber,[11] Gongon,[12] von Eiselsberg,[13] and Quinquam.[14] The following investigators had negative results: Hyvert,[15] Senger,[16] Senn,[17] Shattuck and Ballance,[18] Peyrilhe,[19] Klebs,[20] Schweinglt,[21] Villemin,[22] Cazin and Duplay,[23] Billroth,[24] Valentin,[25] Vogel,[26] D'Anna,[27] Arcangeli,[28] Chotin,[29] Fischel,[30] Chatin,[31] Henoque,[32] and Paulowsky.[33] The successful transplantations were made from man to dogs, rats, and white mice. From the above it can be concluded that many transplanted cells perish, despite the fact that (as shown by successful transplantation) carcinoma cells have inherent qualities that allow them to grow when transplanted. Transplantations of carcinoma cells from animal to animal were made by Langenbeck (who transplanted a medullary carcinoma from dog to dog), by Novinsky[34] (who transplanted cells from a carcinoma of a dog into forty-two dogs, with positive results in two), and by Hanau,[35] who transplanted carcinoma from rat to rat. Moran[36] discovered a carcinoma

in the right axilla of a white mouse, from which he transplanted cells into ten white mice, producing carcinoma in eight. From these last he successfully inoculated ten mice; some of them developing tumors of their own size. Doutrelepont,[37] Shattuck and Ballance, Duplay and Cazin, Trasbot,[38] Gratia and Lienaux,[39] and others had negative results. Implantations of carcinoma cells from man to man have been made by Hahne,[40] who transplanted small nodules of an inoperable carcinoma of the mamma successfully into the other breast. Alibert (cited by Senn) failed to transplant a carcinoma into his own body or into students.

Senn[41] reports a carcinoma of the skin on a lower extremity. The patient objected to amputation, and parts of the carcinoma were implanted into the subcutaneous tissue on the posterior surface of the leg. After four weeks this implanted piece had become absorbed. Senn reports (*Journal of the American Medical Association*, Sept. 28, 1901): "On May 4, 1901, the writer inoculated himself with carcinoma tissue, immediately after he had completed a radical operation for advanced carcinoma of the lower lip. The patient from whom the malignant graft was obtained was an Irishman 60 years of age. The submental and submaxillary lymphatic glands were involved. The glands were immersed in warm saline solutions, and from one of them a fragment the size of a split pea was used for implantation. A small incision was made about the middle of the forearm, over the supinator muscles, under strict aseptic precautions. One of the margins of the little wound was undermined sufficiently to make a pocket large enough to receive the graft. After implantation the wound was closed with a horsehair suture and iodoform collodion. The operation was performed by one of my assistants, Dr. Lyman. The carcinomatous nature of the glandular affection was proven by a microscopic examination of the gland from which the graft was taken. In the course of a week a nodule the size of a pea made its appearance, which remained stationary for two weeks, when it gradually disappeared. At the present time (June 22) a linear red scar indicates the site of implantation."

The result of this implantation has so far been negative, but years must pass before this case can be classed with the unsuccessful implantations, since such cells may be dormant for years and then suddenly commence to multiply and produce a carcinoma. It should be remembered that cases have been observed in which metastasis in a regionary lymphatic gland has developed fifteen and twenty years after the primary tumors had been removed by operation.

My own conception of the origin and development of carcinoma is as follows: Normal epithelial cells which are exposed to chronic

disorders of circulation undergo various changes in form and function. Their method and time of multiplication are also changed, and this leads to abnormal grouping of cells. Proliferating epithelial elements under the influence of a mechanical trauma are pressed into the deeper tissues, accompanied by sprouting blood-vessels and surrounded by hyperemic and edematous areas and more or less cellular infiltration. Here they form the body of the primary tumor, and from here some of their cells are carried to distant parts, mainly by the lymphatics. Many cell embolisms are lost, while others lead to development of metastases through a proliferation of their own cells, which become enclosed in the meshes of a framework formed by the proliferating connective tissue and the sprouts of blood-vessels of the organ invaded. The cells of the primary growth may develop noticeable physiologic activity, manifesting itself also in the metastases or physiologic function which may not be recognizable in the primary growth, but again is plainly discernible in the metastasis. The primary growth may be physiologically active; not so the first metastasis, but the next metastasis may exhibit clear evidence of physiologic activity. By physiological activity is here meant demonstrable physiologic activity, since physiologic activity is probably always present in carcinoma cells. When physiologic function is not observed in the primary growth, but shows itself in the metastasis, then this means that while not entirely absent in the primary growth, it has been so reduced as to become unnoticeable. Observations show that carcinoma cells may retain the physiologic function of the cells from which they are derived. Perls[42] has observed production of bile in adenoma malignum of the liver. Hansemann[43] and Heller[44] made similar observations in carcinoma of the liver; both have seen production of bile in metastasis from a primary carcinoma of the liver. Von Eiselsberg[45] removed a thyroid carcinoma, whereupon cachexia developed. This disappeared when a metastasis developed in the sternum, but returned when this metastasis was removed.

The following case came under my[46] observation: A carcinoma of the right labium majus was removed by Riedinger, of Würzburg, in 1888. The patient died soon after the operation. Necropsy revealed but one metastasis, which had developed in the myocardium and pericardium. The cells of the metastasis contained eleidin as found in the cells of the skin. *Observation 2:* In 1896 I examined a primary carcinoma of the liver in a man 28 years old. In the left lobe was a large, whitish, carcinomatous mass the size of an apple. The central parts of this were stained deeply green with bile. In metastatic carcinoma of the liver I have never seen that. *Observation 3:* The colored illustration (Fig. 1) shows an adenocarcinoma

FIG. 2.—Ulcerating carcinoma of the esophagus and an ulcerating implantation carcinoma in the stomach.

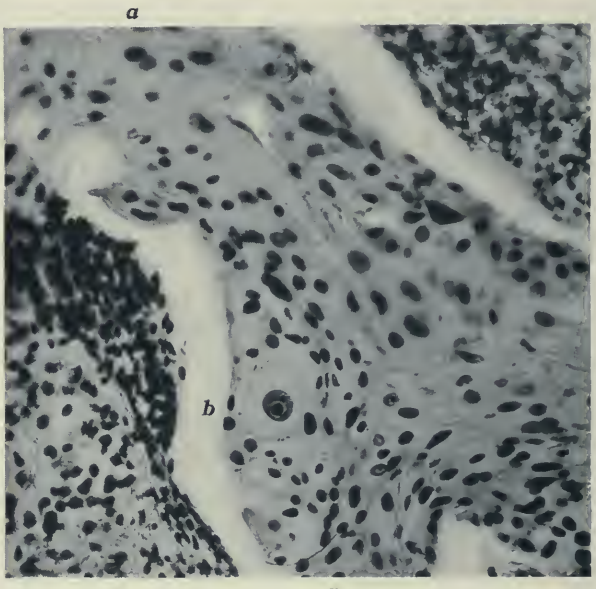

FIG. 3.—Microscopic section of the implantation carcinoma (Fig. 2). A column of squamous epithelial cells filling out the very much distended lumen of a gland of the mucosa of the stomach.

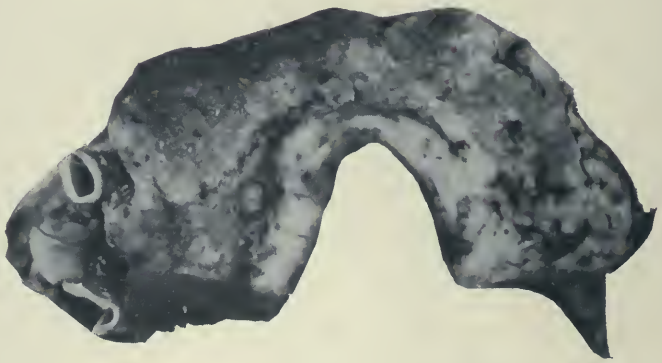

FIG. 4.—Primary carcinoma of the thyroid gland. Cross-section which shows the cut section of the growth and the ingrowth into the walls of the trachea, which appears much narrowed.

of the liver with a large nodule, one-half of which is of deep green color from the presence of bile. *Observation 4:* After the resection of a large medullary carcinoma of the stomach by Malcolm L. Harris, I cut off part of the carcinomatous mass which was not connected with the inside of the stomach, just beneath the serosa. I made a glycerin extract of those masses, and found, after addition of hydrochloric acid, that the extract digested boiled egg-albumen promptly in the incubator. *Observation 5:* Elsewhere I shall report a case of carcinoma of the thyroid gland which led to an implantation of carcinoma cells into the lower lobe of the right lung, where it produced large quantities of colloid, while no colloid was to be seen in the primary growth. The implanted cells again showed more normal forms than those of the primary tumor, and a similar arrangement in rings as they do normally in the thyroid gland. That means a lessened anaplasia of the cells as compared with that found in the primary growth, which found its expression in the more normal forms of the cells, their normal arrangement, their physiologic activity, and their slower growth. If the carcinoma cells retain their physiologic properties, a fact which after what has been said has been well established, then we must add a very important factor to the different causes of cachexia, which not only has a great influence on the degree of cachexia, but which according to its own nature determines the different forms of cachexia. If large masses of continually multiplying carcinoma cells continue to be physiologically active, and if the circulation and therewith the whole body is continually supplied and overloaded with their products, then it is plain that the cachexia in different forms of carcinoma must be of a different type. The difference in the character of cachexia should receive greater attention, and a more accurate study of the changes to be found in the blood may lead to useful results.

AUTOIMPLANTATION OF DETACHED CARCINOMA CELLS INTO DISTANT PARTS OF THE HUMAN BODY.

Virchow[47] early called attention to autoimplantation of carcinoma cells in the peritoneal cavity, saying: "In connection with a carcinoma of the stomach, which reaches down to the serosa, we occasionally see a multiple eruption of carcinomatous nodules on the peritoneum, not evenly distributed, but in distant places, which are apt to catch and hold parts that have slipped down along the smooth inner lining of the abdominal covering. Such places are the ligamenta vesicæ lateralia, the excavatio-recto-vesicalis, recto-uterina, and utero-vesicalis."

Orth[48] has observed the same, but he has also seen an implanta-

tion in an upward direction, from a colloid carcinoma of the cæcum to the serosa of the stomach.

In the pleural and pericardial cavities similar conditions prevail, and I have seen quite a number of autoimplantations in the peritoneal and one in the lower part of the pericardial cavity, where the upper parts of the pericardium had been invaded by carcinoma. A very few cases of autoimplantation have been observed in the digestive tract—eight in all, to which I add one. Moxon[49] and Erbse[50] have each described an implantation into the lungs from a carcinoma of the esophagus, and to the scant literature of implantation into the lungs from the upper parts of the respiratory tract I can add one. Such cases show that fully detached carcinoma cells from a carcinoma in man may become successfully implanted into distant parts of the body. Compared with the unsuccessful attempts which have been made to implant normal epithelial cells, this seems to suggest an inherent malignancy in the carcinoma cells.

If we desire to solve the problem of the etiology of carcinoma, we must stop right here to find out whether the carcinoma cell really possesses qualities never contained in normal epithelial cells, and which produce an inherent malignancy, or whether there is only an apparent malignancy of the cells, still allowing us to classify them, although they are changed somewhat within the range of normal epithelium.

CARCINOMA OF THE ESOPHAGUS WITH IMPLANTATION OF A FLAT-CELLED CARCINOMA INTO THE MUCOUS MEMBRANE OF THE STOMACH.

The carcinoma of the esophagus was 5 centimeters in length, its lower margin being 6.5 centimeters above the cardia. The growth shows a firm infiltration of all the layers of the esophagus, the walls of which in the affected territory reach a thickness of 1 centimeter, appearing whitish on section and of firm consistency. The tumor protrudes into the lumen of the esophagus, narrowing the latter considerably. It has an ulcerated inner surface, the mucous membrane of which had been destroyed.

In the cardiac portion of the stomach there is a shallow elevation measuring 2 centimeters in length in a direct line with the longitudinal axis of the esophagus; in width it measures up to 1 centimeter, and its shape is nearly cylindrical. One-fourth of a centimeter beneath it commences a walled ulcer which also lies along the line corresponding to the continued longitudinal axis of the esophagus; it measures in this axis 4.5 centimeters, and its greatest cross diameter is 2.5 centimeters. The ulcer is of irregular form

with shallow eaten edges, surrounded by shallow walls brownish-yellow in color, with a diameter of .5 centimeter and a highest elevation of almost .25 centimeter above the mucous membrane. This wall has a horny appearance.

There are no other changes present which need to be described.

Microscopic Examination.—Sections of the wall of the ulcer show absence of the normal mucous membrane of the stomach; instead masses of large, flat-celled epithelia arranged in nests, surrounded by a well developed stroma of connective tissue. Similar changes are also observed in the muscularis of the organ. As mentioned before, these cells are very large, and it may be added that their nuclei are rich in chromatin, sometimes to such an extent that the nuclei in specimens stained with hematoxylin appear as large clumps, making the recognition of their structure impossible.

Here and there protozoa are to be noticed; one of our micro-photographs* represents such a protozoan, with characteristics so well compared by Leyden to the appearance of a bird's eye.

Diagnosis.—Flat-celled carcinoma of the esophagus with ulcerating surface, from which cells have become detached, and on entering the stomach have been pressed into the mucous membrane of that organ, giving rise to an implantation carcinoma. Such cases are of great interest, because they show that cells from a carcinoma which have become completely detached may be successfully implanted into a distant part.

The question may be raised whether such an implantation has really occurred in this case, and other possibilities must be considered. They are: (1) A growing downward into the stomach from the esophagus by continuity; this can safely be excluded. (2) By way of the lymphatics. No connection existing between the esophageal lymphatics and those of the stomach, this can also be excluded. (3) Metastatic embolism. Although it may be said that in such cases other metastases would be found, still this is not necessarily true; with tumors we frequently find but one or a few metastases in distant organs, though cells must have been distributed over the greater part of the body, none, or one, or but a few metastases having developed.

I have seen a carcinoma originating from the skin of the right labium majus, which made but one metastasis in the myocardium, while no doubt cell embolisms had occurred in all organs. Although we cannot exclude the possibility of metastatic origin, we consider that mode of development in this particular case as quite improbable.

4. To my knowledge, such developments of epithelial cells of

*For this microphotograph I am indebted to Dr. Robt. Leit.

the squamous character have never been observed in the stomach, except in connection with carcinoma of the higher portions of the digestive tract, of which there are but few cases on record.

5. The fact that the two foci found have developed in portions of the stomach near the cardia, where the lumen of the organ is still small and where its walls come into very close contact with each other when the organ contracts, also suggests that cells entering here have been forced into the mucous membrane by pressure.

Microscopical Findings.—But little need be said about the microscopical examination. It is sufficient to state that the focus in the stomach is a flat-celled carcinoma, and, therefore, secondary in character; that the flat cells fill (Fig. 2) the distended lumina of the glands of the mucous membrane (Figs. 2 and 3, *a a*); that some of the cells are very large, their nuclei sometimes showing an abundance of chromatin, and that they are surrounded by a large protoplasmatic area (Fig. 3). In one section a formation is found that resembles a protozoön (Fig. 3, *b*), but while I record such findings I do not consider them of intrinsic value.

Here and there small nests of flat cells are observed in the muscularis, while on the whole the new formation has a very superficial character, as it is mainly confined to the mucosa. It shows a very shallow ulceration, almost as extensive as the growth itself.

Literature.—There are but a few of such cases on record:

1. Klebs[51] has described three: (*a*) An ulcerating flat-celled carcinoma of the esophagus and an implantation from this in the regio cardiaca; (*b*) an ulcerating carcinoma of the face, that broke into the mouth and pharynx, and was followed by the development of a flat-celled implantation carcinoma in the pyloric region; (*c*) a carcinoma of the tongue with an implantation carcinoma in the stomach at the greater curvature.

2. Van Haren Norman[52] observed a case of carcinoma of the esophagus with superficial ulceration, situated near the cricoid cartilage. Below it there was a second growth of 8 centimeters in length, which involved nearly the whole circumference of the esophagus. The rest of the esophagus was normal, but in the portia cardiaca was found an implantation carcinoma the size of a pea.

3. Beck[53] describes a case of ulcerating primary carcinoma of the esophagus, with an implantation carcinoma in the lower end of the esophagus and the stomach near cardia.

4. Hektoen[54] observed an ulcerating carcinoma of the esophagus 6 centimeters below the bifurcation of the trachea, which measured 3 × 1.5 centimeters. The rest of the lining of the esophagus was smooth. In this case there was an implantation carcinoma in the

walls of a large ulcer of the stomach, which was located in the cardiac region.

Those six cases are the only ones of this kind recorded in the literature, in which there is no doubt as to the origin of the secondary carcinoma in the mucous membrane of the stomach from an implantation of squamous epithelium coming from a part of the digestive tract above the stomach. If I add my own case to the list, then there are seven altogether.

The reasons which allow me to conclude that these are real implantations are:

1. There is no direct, visible connection between the primary and the secondary growth, so the latter has not originated by continuity.

2. The flat cells cannot have come by way of the lymphatics, as the lymphatic system of the esophagus and that of the stomach are separate, at least so far as our present knowledge extends.

3. It is not probable that these foci are metastases which have come by way of the blood-current, as metastases are rarely found in the stomach, and as there were no metastases in other organs.

Of the reasons so far advanced, the first one holds good, while the second and third are only of relative value. As to the second, it must be admitted that our knowledge of the distribution of the lymphatics leaves much to be desired; and as to the third, we must remember that many metastases perish, and that often only one or a few metastases are found in cases of carcinoma, in which we have reason to believe that all or most of the organs of the body have received about an equal share of the cells from carcinoma which had entered the circulation. To illustrate this I only call attention to one case of my own.

4. The squamous cells are located superficially in the mucous membrane; they have just commenced to invade the muscularis, while the affected area is quite extensive on the surface. The growth has a decidedly superficial character, which would not be the case if it was of embolic origin.

5. The squamous cells are found mainly in the lumina of the glands of the mucosa.

6. These implantation carcinomata have all—with the exception of the third case of Klebs—occurred in a narrow part of the stomach, where contractions of the organ are more apt to press cellular material into the glands than would be the case in the wider portions.

Locations.—Klebs: Cardiac region, pyloric region, greater curvature. Van Haren Norman: Cardiac region. Beck: Cardiac region. Hektoen: Cardiac region. Fütterer: Cardiac region. Kraske: Cardiac region.

Klebs's book, in which his cases are published, is not at my disposal, and so I am unable to suggest the cause of this deviation from an apparent rule.

7. At last it may be said that the fact that formations like those in question are only observed in the stomach when carcinomata of the upper parts of the digestive tract are present is sufficient proof, not only of their secondary nature, but also of their character as implantation carcinomata.

8. The second case of Klebs of carcinoma of the face and pharynx, and his third case of carcinoma of the tongue, exclude the probability of propagation by way of lymphatics.

Two implantations of carcinoma have been observed in the rectum by Kraske:[55]

Case 1.—Woman 52 years of age had dysentery at the age of 20. Three years before she presented herself, constipation, hemorrhages, and emaciation developed. There was a cylinder cell carcinoma of the rectum which the finger could reach, and 10 centimeters below, just above the sphincter ani on the left side of the mucous membrane, two nodules were found, each the size of a lentil. They were excised and showed the structure of a cylinder cell carcinoma like the upper tumor. The mucous membrane between the upper and the lower growths was found to be perfectly normal.

Case 2.—Woman 43 years of age had been constipated for one aud a half years, during which time occurred hemorrhages per rectum, and emaciation developed. High up in the rectum a circular ulcerating carcinoma was found, and 10 centimeters below it, near the anus posteriorly, a hard and slightly ulcerated nodule. The mucous membrane between the upper and lower growths was normal, and the structure of both was that of a cylinder cell carcinoma, the lower nodule being surrounded by squamous epithelial cells (Goodhart[56]).

NATURAL IMPLANTATION OF DETACHED CARCINOMA CELLS FROM UPPER PARTS OF THE DIGESTIVE TRACT INTO LOWER PORTIONS OF THE RESPIRATORY TRACT.

Moxon reports a case of a man 48 years of age: "In the esophagus a cancerous growth, forming a thick-based sore, with raised edges, was found opposite the middle of the trachea. The carcinoma extended toward the larynx and passed through into the trachea, to present itself there in low elevations, whose surface, however, as far as the naked eye could see, was free from ulceration or other abrasion. The only other place in the body in which cancer was found was in the lower lobe of each lung; here it was present in the shape

of several small, rounded, firm growths which were situated not at the surface, but in the depth of the tissue; they occupied the centers of the lobules, and small bronchi could be traced to them. Microscopic examination of the growth in the esophagus showed a perfect specimen of the epithelial type of cancer, having the characteristic 'bird's-nest' capsules in perfection. The little growths in the lung showed the same structure, the 'bird's-nest' capsule being here remarkably perfect and striking to the eye."

Erbse describes a carcinoma of the esophagus which had broken into the trachea, particles of it having been aspirated. Numerous proliferations of carcinomatous masses were found in the lower parts of the lungs, developing from the smallest bronchi and alveoli.

NATURAL IMPLANTATION OF DETACHED CARCINOMA CELLS FROM UPPER TO LOWER PARTS OF THE RESPIRATORY TRACT— CASE OF PRIMARY CARCINOMA OF THE THYROID GLAND.*

Hattie M——, aged 39 years, colored, a cook; has had no diseases which would throw light on the present trouble. A goitre was noted in early life, but the tumefaction diminished and gave no trouble.

About five weeks before admission to the hospital she suffered from sore throat and coryza, followed by a cough associated with a dysphagia, which grew so serious as to entirely preclude the use of solids, and at times of fluids. Dyspnea and other symptoms have steadily increased. She has noted an increase in size of and pain on the right side of the neck. Has lost between 45 and 55 pounds in weight during the last four months.

The patient was haggard, the skin was dry and rough, and intense dyspnea was observed. At the right side of the trachea, extending downward toward the clavicle, was a rather hard, nodular, lobulated mass, apparently associated with the thyroid gland, moving up and down with respiration. The skin over it was movable, but the mass was firmly adherent to the subjacent structures; the left lobe of the organ was movable and not enlarged. Râles could be heard over part of the chest, especially the right upper lobe. These became more marked, and pleuritic friction sounds could be heard over the greater part of the right lung. The tracheal respiratory sound was intensified.

Laryngoscopic examination by Dr. F. Menge showed a small tumor, conical in shape, with a diameter of about half an inch at the base, just below the vocal cords and a little to the right of the

*For the clinical history I am indebted to Dr. Weller van Hook.

median line. Later examination showed a gradual increase in the size of the tumor.

Post-mortem Examination.—All parts of the thyroid gland are somewhat enlarged and hard. On cross-section, the anterior portion of the gland is seen to be of a brownish-yellow color, semitransparent, and firm (colloid struma); while the central portions are composed of white milky spots, mixed with dark-red lines and spots that are particularly richly developed on the left side of the gland near the wall of the trachea, and which on the anterior wall have broken through and partly replaced tracheal cartilages. On the right side the whitish parts invade more and more the first described colloid portions; the same is the case in the right half of the middle lobe, where they also partly reach the periphery of the gland (Fig. 4).

Posteriorly, the white masses invade the walls of the esophagus, changing them to a hard, rigid mass and causing a considerable degree of stenosis.

At the posterior insertion of the vocal ligaments there is some swelling and thickening of the mucous membrane (Fig. 5). The thickening involves the whole trachea down to the bifurcation, increasing in the lower portion; but it is often intermingled with

FIG. 5.—*a*, *a*, Carcinoma of the thyroid gland; *b*, trachea with white elevations marking the ingrowth of carcinoma.

FIG. 6.—Primary carcinoma of the thyroid gland, breaking into the trachea. The places being indicated by whitish elevations of the mucosa of the trachea.

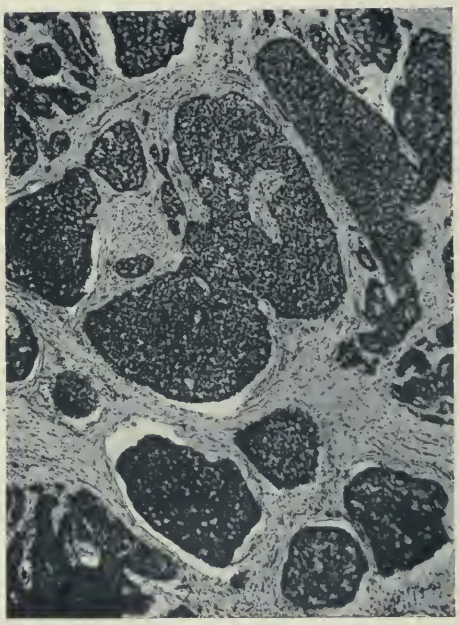

FIG. 7.—Microscopic section of the wall of the trachea invaded by the carcinoma of the thyroid gland. Nests of carcinoma cells are seen everywhere in the mucous membrane, and the mucous gland and their ducts are filled with carcinoma cells.

FIG. 8.—Cut surface of the right lung, with dense portions of a muddy appearance, which are filled with colloid. The upper parts emphysematous.

irregularly formed milky patches of very different size, some of which become quite prominent over the inner surface of the trachea; the largest one of these patches or nodules is located on the anterior wall, and reaches from the middle of the thyroid cartilage downward for a distance of three centimeters; it is 1½ centimeters in width. Laterally on both sides, between the cricoid and thyroid cartilages, we find small perforations, and the mucous membrane which surrounds them is green in color.

Only two slightly swollen lymphatic glands are found in the vicinity of the large thyroid gland. The thyroid measures 6½ centimeters in length and 7 centimeters in width. The trachea in its lower portions and the two main bronchi are dilated. An enlarged gland is found in the angle between the left subclavian artery and the aorta; this gland was about the size of a small walnut.

Both lungs but partly collapsed. The right lung is adherent to the costal cartilages. The upper lobe is soft, the middle and lower ones are very firm. The lower and also the middle lobe show many hemorrhagic and dense areas which altogether involve nearly the whole lobe. The pleura is covered with a thick layer of fibrin (Fig. 6).

The left lung shows spots similar to the right, but they are not so numerous. The upper lobe is soft; the lower lobe is firm and shows ecchymoses, particularly laterally. Atelectatic areas are also seen, and numerous small pleural metastases. The bronchial tubes in both lungs are dilated.

Heart: There is a moderate amount of clear fluid in the pericardial cavity. The size and shape of the heart are normal; color a little dark. The right auricular appendix contains a lardaceous clot, filling out the tricuspid ostium. A similar coagulum is found between the trabeculæ in the right ventricle, and this clot extends into the pulmonary artery to the point of first branching. There is fatty degeneration of the intima of the ascending aorta.

Spleen: Normal. One accessory spleen.

Stomach: A thick mucus covers the mucous membrane; the pyloric portion is pale; the mucous membrane is relatively rough (chronic gastritis).

Liver: The right lobe is elongated; the organ is pale; there is fatty infiltration.

Kidneys: Dark-reddish color; fetal lobulation; otherwise normal.

Bladder: Enlarged; structure normal.

Sexual organs: The uterus is enlarged and irregular in outline. Subserous and intra-mural fibromata; one, on right side, especially large, lies near the insertion of the tube, the diameter being one-half centimeter. There is another of similar size in the ligamentum

latum. Several pedunculated cysts near the tubes. The right ovary is large, movable, and strongly vascular.

Pharynx: The mucous membrane is dark-red; inflamed.

Larynx: The aryepiglottic folds are swollen and wrinkled. The vocal ligaments and the wall of the larynx are injected and infiltrated.

Trachea: Mucous membrane is intensely hyperemic, with some whitish elevations of irregular form.

Tongue: The papillæ are enlarged.

Diaphragm: Shows subpleural metastasis.

Diagnosis.—Colloid goitre, carcinoma of the thyroid gland breaking into the trachea. Implantations in the lungs and metastasis from those implantations in the pleura.

Larynx: The mucous membrane of the aryepiglottic folds is of a dark-red color and wrinkled. Posteriorly near the median line just below the vocal cords there are two perforations of the mucous membrane around which there is a greenish discoloration. The mucous membrane from the vocal cords downward to the cricoid cartilage is quite uneven, red in color, and shows numerous small nodules, which, as seen through the mucous membrane that covers them, appear of a yellow-white color. In some portions the nodules are almost continuous, while in others, particularly over the left side of the larynx, they give a picture similar to miliary tuberculosis. One-half centimeter beneath the anterior insertion of the vocal ligaments a large swelling abruptly commences, reaching downward 2¼ centimeters, its largest diameter being 1¾ centimeters, protruding about ½ centimeter into the lumen of the larynx. The shape of this nodule is oval; it is cream-colored, firm, and elastic. Beneath it the mucous membrane is quite hemorrhagic to about 3½ centimeters above the bifurcation of the trachea, and in this hemorrhagic zone nodules of the same kind as the one described, only smaller, appear in great numbers, changing the shape of the lumen very much.

Metastasis.—Subpleural metastases are represented by shallow, slight elevations, somewhat irregular in outline, but on the whole nearly round or oval; they differ in size, from those which are hardly visible, to the largest, which are from 1 to 0.5 centimeter in diameter. While the surface of the smaller ones and also their color is quite uniform throughout, the largest ones show a slight depression in the center, and a reddish-blue color.

Macroscopic Findings.—The thyroid gland is somewhat but only moderately enlarged, measuring 7½ centimeters crosswise; the right lobe 3.6 centimeters; the left lobe 5 centimeters; the middle lobe 4½ centimeters. The blood-vessels in the vicinity of the thyroid have been pushed aside. The gland is somewhat nodular, brown-

ish, of firm consistency. A cross-section of the thyroid gland and of the larynx shows four distinctly different zones (Fig. 7):

First zone: Lies just beneath the mucous membrane and measures about one-half centimeter in thickness. It is of a milky color, and occasionally pieces of cartilage are found in it.

Second zone: This is characterized by its strong vascularization; it measures one-half centimeter in width.

Third zone: It is of a yellowish-gray color; it measures two centimeters on the left side, one-half centimeter in the center anteriorly, and two centimeters on the right side, where it practically takes the place of the right lobe. It cannot always be sharply distinguished at its meeting with the following zone.

Fourth zone: The fourth or anterior zone, representing the anterior portion of the gland, is found mainly in the left and middle lobes, while there are no indications of it in the right lobe; it measures one centimeter at the extreme left and one-fourth centimeter at the center, with an irregular posterior zigzag margin. The color is a muddy light-brown, semitransparent, and the consistency is firm.

To repeat: The first or internal zone is less vascular than the rest, and represents the zone in which the destruction of cartilage has taken place and in which the mucosa has been pushed forward far into the lumen of the larynx, having itself become invaded by a carcinomatous mass. The second zone is highly vascular. The third zone shows a new growth moderately vascularized. The fourth zone represents a colloid goitre, becoming invaded by carcinoma.

On the pleural surface of the diaphragm there are metastases, and it may be said that the color of the metastasis is very similar to that of the older parts of the primary growth. It is interesting to compare the color of these two with the color of the right lower lobe of the lung. That part of the lung is uniformly filled with metastatic growths which are in marked contrast to all the others. The consistency is at least as great as we find it in fibrinous pneumonia during the stage of red hepatization; but it is a little more elastic, and the cut surface appears very smooth. While the lower portions of the lung are quite uniformly involved, the changes are irregularly distributed in its upper part; but as a rule they are in communication with the mainly affected portions, only branching upward from them. The color of the parts involved by the metastasis is a brownish-black and of a semitransparent character, bearing a great resemblance to colloid goitre.

A large gland which was found in the angle between the left subclavian and the aorta has the appearance of a colloid struma.

Microscopic Examination. — Zone No. 1, the oldest part of the tumor, which is found in the posterior portion of the gland encroaching on the walls of the esophagus, is made up of large, rather dense epithelial cells of cylindrical form which are arranged in nests. Little vascularization is visible in this zone. Zone No. 2 shows an abundance of injected blood-vessels, and between them more or less compact nests of cylindrical cells. Zone No. 3 shows numerous nests of epithelial cells, between them a thick reticulum, and sometimes large masses of connective tissue with a moderate degree of vascularization, while here and there blood-vessels appear, more richly developed in patches. The most striking difference between this zone and the others is the tendency of the cell masses to glandular arrangement, regular outlined lumina appearing everywhere in the cell nests. There is little intercellular substance present; but it can be shown by eosin stain, which makes it visible in the less dense collections of cells. This zone passes gradually into the next zone, No. 4; here the characteristic changes are due to colloid goitre, the most peripheral portions not even being involved in the growth, while the others become gradually invaded.

I have adopted the division into four zones for the purpose of making plain the successive development of the new growth from the posterior parts of the gland toward its anterior portion; but to this description should be added certain secondary developments affecting the normal structure of the larynx. These are the destruction of the cartilage, the involvement of the mucous membrane, and the involvement of the mucous glands.

As concerns the destruction of cartilage, the tissues of the perichondrium have been invaded by nests of epithelial cells, and wherever this invasion is massive, or wherever it reaches into the deeper layers of the perichondrium, peripheral necrosis of the cartilage results; and then its perfect destruction is brought about by large cell nests, the periphery of which sometimes shows unusual vascularization, pressing against the cartilage. In this way cartilaginous portions frequently become sequestrated, and are then to be found as small cartilaginous islands surrounded by tumor masses.

The cell masses which have invaded the mucous membrane all show a uniform arrangement, somewhat arcade-like, sometimes plainly of an "S" shape. There are no signs of inflammatory changes in the tissues of the mucosa between them, and the epithelial layer of the mucous membrane is only a little thickened (Fig. 8).

It is very interesting to note that numerous mucous glands of the mucosa are filled with carcinoma cells which show distinct glandular arrangement, also lining their ducts, thus establishing a constant

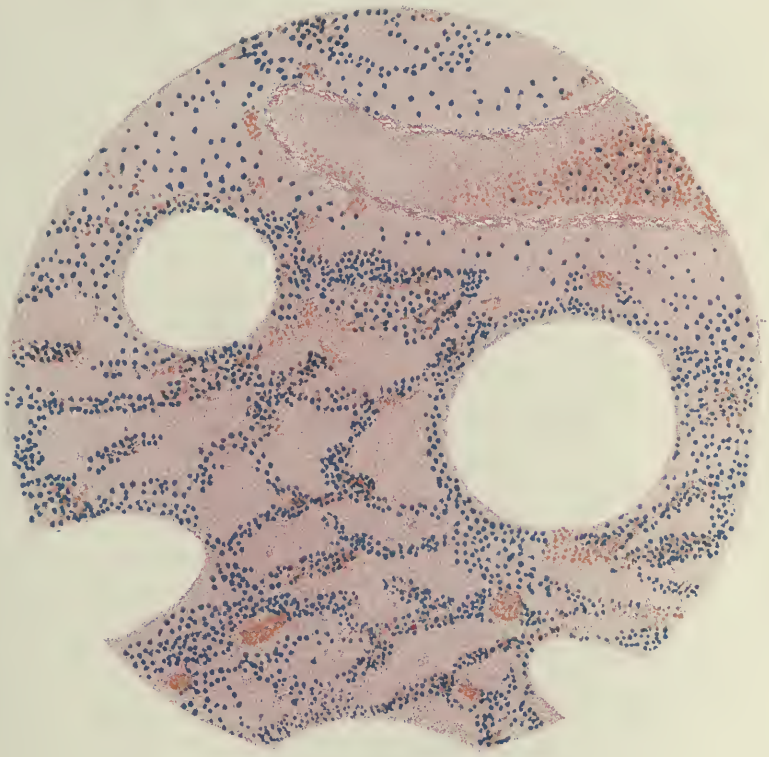

FIG. 9.—Microscopic section of the right lung. The alveoli are filled with colloid, which is stained with eosin. Paraffin section. Hematoxylin eosin stain. (Drawn by Mr. Gustav Egeland.)

communication between the tumor masses and the lumen of the larynx and trachea.

Subpleural and Diaphragmatic Metastases.—But little can be said about these; still I consider it quite important to mention that while their macroscopic conditions bear great resemblance to the macroscopic conditions as found in the primary tumor, here also but little intercellular substance resembling colloid was found.

Right Lower Lobe.—In the right lower lobe conditions are quite different. Here we find on many cross-sections the lumina of the bronchi filled with a substance taking a moderate amount of eosin stain, in which are suspended round cells, and also cylindrical epithelial cells, the masses of the latter often showing a marked tendency to glandular arrangement. Such cells in even more outspoken glandular arrangement are found in the interlobular and intralobular spaces, which both show a very high degree of vascularization.

As a very important finding I wish to mention that the lung tissues are saturated with a homogeneous substance taking the eosin stain; and that this same substance fills out the lumina of the alveoli and smallest bronchial ramifications in the affected parts, as Fig. 9 shows.

Pneumonic changes are found in very small areas here and there. It has already been mentioned in the post-mortem report that fibrinous pleurisy was present, and a further description of the changes caused by it is considered unnecessary.

Findings in a Gland.—The cross-section of an enlarged peribronchial gland shows invasion by metastasis, a high degree of hyperemia, and large homogeneous areas which also take the eosin stain well (colloid).

RÉSUMÉ.

My conception of the case is as follows:

A primary carcinoma consisting of cylindrical epithelial cells has developed from the posterior portions of a goitre which were subject to friction and pressure caused by food passing through the esophagus during the act of deglutition.

The carcinoma has developed toward the anterior parts of the goitre. It has destroyed the cartilages by ingrowth, invaded the mucous membrane of the larynx and trachea in numerous places, and has broken through this membrane in two places beneath the posterior insertion of the vocal ligaments as mentioned in the post-mortem report.

From here tumor particles of macroscopic size have fallen into

the air-passages, entering the largest branches as foreign bodies do, thus reaching the finer ramifications of the bronchial tree in the right lower lobe of the lung; here they produced colloid, in which they are found suspended, and which saturates the lung tissues and fills the alveoli. Then an invasion of the interlobular and intralobular tissues has taken place, and a distinct glandular arrangement has developed. In connection with the invasion a high degree of hyperemia of the affected parts of the lung has been caused, and this, together with the presence of great masses of colloid in the organ, has produced an appearance very similar to colloid goitre.

The lymphatic glands in this region have also been invaded, are hyperemic, and contain sufficient deposits of colloid to give them an appearance resembling colloid goitre.

There was but very little production of colloid in the parts of the primary growth which appeared white, and in the subpleural and diaphragmatic metastases; this can probably be explained by a lack of space preventing a typical glandular arrangement of the cells, and therefore a sufficiently localized production of colloid to allow it to become visible. A very meager blood-supply may also have something to do with it.

To explain the metastases in the lung and in the pleura I think it probable, first, that cells from the carcinoma in microscopic portions have been thrown into the air-passages, since perforations have occurred. Secondly, that there has been a constant supply of such cells from the affected parts of the mucous membrane of the larynx and trachea, and the inspiratory movements of the lungs have permitted them to reach the alveoli, where they were taken up by the lymphatics and carried to the subpleural lymphatic spaces.

According to my observations concerning the mucous glands of the larynx, it seems unnecessary for growths to perforate into the air-passages in order to cause implantations in the lungs, as the glands through their ducts may furnish a constant and rich supply of carcinoma cells to the air-passages. It is true that most of the cells must be expectorated, while pieces of tumor masses, falling into the air-passages from perforation, by gravity, are more apt to sink down to the deeper parts of the lungs and become implanted; but the other possibility exists and must be considered.

The few metastases on the pleural surface of the diaphragm which show the same forms and colors as the subpleural metastases may have originated in two ways: (1) Cells from subpleural metastases may have dropped into the pleural cavity and then become implanted; or (2) they may be contact metastases.

As to the substance saturating the lung tissue, it is quite proper to raise the question whether it is really colloid, or whether it might not be of a mucoid character. The brownish color of the affected parts of the lung and the affected glands, and their very firm consistency, particularly the latter, the smoothness of the cut surface, and also the fact that the fresh cut surfaces of the lungs were not slimy and slippery, exclude mucoid material.

The fact that metastases from a carcinoma of the thyroid gland can again assume the physiological properties of the latter is well illustrated in this case, and also by an observation published by von Eiselsberg. In this case tetany developed immediately after the removal of the entire thyroid for adenocarcinoma, but the tetany disappeared when cachexia strumipriva set in; the latter lasted for several months, and disappeared when a secondary tumor developed in the manubrium of the sternum. After two years the tumor in the sternum had to be removed, and after this had been done tetany again appeared until cachexia again took its place, lasting until the patient died, although metastases had developed in skin and bones.

From this it would seem that the first metastases had performed physiologic functions of the thyroid gland, but not so the latter ones, or probably they were not sufficiently developed.

Concerning the development of metastases in the lungs in connection with carcinoma of the thyroid gland, we may assume that most of them, if not all, are due to implantation, as the primary growth, which may easily break into the lumen of the larynx or trachea, or, as many mucous glands of these parts become affected, large masses of cells may continually be thrown into the air-passages. Ewald detected the presence of iodine in the metastases of carcinoma of the thyroid gland, while none could be found in the primary growth.

Schmidt has seen a metastasis from a carcinoma of the thyroid gland in the pleura, which repeated the structure of the thyroid gland and secreted colloid, while no function was observed in other metastases.

Both observations agree well with mine, inasmuch as the primary growth showed no visible production of colloid; while the metastases in the lung represented structures which sometimes showed almost a complete picture of the normal thyroid gland, with large masses of colloid. It is certainly interesting to note that the carcinoma cells in their primary growth, where they were found in dense nests, had to all appearance lost their physiologic functions, which they resumed to a high degree when transplanted into the lung tissue.

Probably the rich blood-supply in the lung and the more favorable mechanical conditions in the loose structures of the lungs allowing glandular arrangement may explain this.

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DIAGNOSIS AND TREATMENT OF LARYNGEAL TUBERCULOSIS.[1]

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The recent wide-spread interest in the treatment of pulmonary tuberculosis and the efficiency of modern therapeutic measures in seemingly desperate cases warrant a more hopeful view of the treatment of tubercular laryngitis, which has hitherto been a reproach to the science and art of medicine.

Success in the treatment of any disease is dependent on accurate diagnosis; this is particularly true of laryngeal tuberculosis, for in no disease is the employment of routine therapeutics more to be avoided. Each case is a law unto itself, and should be carefully studied in all its aspects, if we wish to accomplish the best results.

The diagnosis of laryngeal tuberculosis is made by obtaining an accurate history of the case; by the symptoms of the disease as related by the patient; by the systematic use of the clinical thermometer; by the appearance of the larynx as seen by the laryngoscope; and by the presence in the sputum of tubercle bacilli. The disease is usually secondary to tubercular infection of the lungs, or other structures, though many cases of undoubted primary laryngeal tuberculosis have been recorded by competent observers, as I have shown in a paper recently presented to the Eastern Section of the American Laryngological, Rhinological, and Otological Society.

The existence of the disease secondary to tuberculosis of the lungs, or other structures, in the majority of instances will naturally lead us to look for constitutional signs, as well as local evidences.

The patient complains of malaise, progressive weakness, loss of weight, night sweats, cough and expectoration. He also notices uneasiness and dryness of the throat, followed later by difficulty in swallowing — the dysphagia in advanced cases being the most distressing symptom, even the blandest nourishment being refused. Impairment of the voice is soon observed, varying from slight hoarseness to complete aphonia, its extent depending on the character and situation of the laryngeal lesions. The cough is strident or brassy in proportion as the voice-producing structures are affected. This is particularly noticed in those whose occupations involve the constant use of the voice with faulty method of tone production, as hawkers, auctioneers, singers, or public speakers. With the cough there is expectoration, at first of mucus, but advanced cases becoming purulent. The patient sometimes spits blood, especially after a severe

[1] Read before the South Branch of the Philadelphia County Medical Society, Jan. 21, 1902.

fit of coughing, but attacks of hemoptysis in laryngeal tuberculosis are not so frequent as in the pulmonary forms of the disease, in which the larger blood-vessels are eroded. The thermometer shows an elevation of temperature of from 1° to 3°, especially toward evening, when it reaches its maximum, falling again in the early morning, when it frequently becomes subnormal. Increased frequency of the pulse and of respiration is also noticed.

An examination of the sputum will usually show the presence of tubercle bacilli, especially when laryngeal ulcerations are present, or the case is secondary to one of pulmonary tuberculosis; but their absence is not to be taken as conclusive evidence of the absence of the disease, especially in the early stages of primary laryngeal tuberculosis.

The laryngoscope affords valuable evidence, and in well marked cases it is often possible to make a positive diagnosis by this means alone.

Among the earliest laryngoscopic signs is a diffuse hyperemia of the larynx, succeeded by infiltration of the mucous membrane, beginning usually in the interarytenoid space, in either arytenoid cartilage, on the laryngeal face of the epiglottis, or in the vocal cords and ventricular bands, especially in those who use their voices in public speaking or singing. The infiltration is usually unilateral, but autoinfection may cause an extension of the disease, when bilateral lesions result. When the mucosa and perichondrium are involved, the crescentic edge of the epiglottis may be so edematous as to form a sausage-like or turban-shaped tumor. In another group of cases the tendency is toward ulceration; the infiltrations rapidly break down and the typical tubercular ulcerations are seen. These ulcers are shallow, irregularly circular, and have a "mouse-nibbled" appearance; they are covered with a mucopurulent secretion which contains the tubercle bacilli; their usual situation is on the arytenoids or the epiglottis, more rarely they develop on the vocal cords and ventricular bands. When treatment is effectual and cicatrization of the ulcers occurs, the resulting contraction of the tissue is not so great as in laryngeal syphilis.

The diagnosis of laryngeal tuberculosis, as a rule, is not difficult, except when a history of preëxisting tuberculous disease in the lungs or other organs cannot be obtained, or when a mixed tuberculous and syphilitic laryngitis is present. Occasionally it may be difficult to differentiate between tuberculosis, syphilis, carcinoma, and lupus of the larynx. In syphilis the history of a cutaneous eruption and of mucous patches in the mouth, nose, or pharynx, the comparatively slight pain, the rapidly destructive ulceration, which is

deep, clean-cut, and symmetrical, the early involvement of the cords, and the prompt improvement which results from antisyphilitic medication, will clear up a doubtful case. In carcinoma the severe pain, the presence of a rapidly growing tumor of nodular outline, situated at or below the vocal cords, the occurrence of a cachexia, and the microscopic appearance of a portion of the growth removed for the purpose, will assist the diagnosis. In lupus pain is not a prominent symptom, there is less edema, ulcers are infrequent, the tubercle bacilli are absent from the sputum, and lupus is also present on the cutaneous surface, especially on the face.

In considering the treatment of laryngeal tuberculosis, it is important to remember that the disease is usually secondary to tuberculous infection of the lungs or other organs, and if we are to accomplish the best results we must first direct our attention toward giving the patient the best possible climatic and hygienic environment.

In the limited time at my disposal it is impossible to describe in detail the sanatorium treatment of pulmonary and laryngeal tuberculosis, so successfully carried out in this country and in Europe, with which you are all familiar. As a general rule, a patient with laryngeal tuberculosis does best in a moderately dry, warm climate of equable temperature, with freedom from dust and high winds, which will aggravate the throat symptoms. He should have abundance of sunlight, and as Birmingham graphically says: "He should have pure air and plenty of it, twenty-four hours out of twenty-four. He should live as much as possible in a state of nature, using his house as an aborigine would the shelter of a tree, hill, or cave, simply to shield himself from the elements when they are unruly or when he needs rest." He should live in rooms uncarpeted, with windows undraped and open night and day. Careful attention should be given to diet, clothing, and physical exercise. He should be taught to breathe deeply, to abstain from the use of tobacco, to spare his voice as much as possible, speaking only when absolutely necessary, and then only in a whisper. In a word, everything possible should be done by climate and general hygiene to assist the patient in the recovery of his health.

The medicinal treatment of laryngeal tuberculosis is local, general, and symptomatic. I will confine my remarks to the local treatment of the disease, giving a brief survey of the methods which have proved efficacious in my hands in a large number of cases. Indeed, I have seen not a few cases of laryngeal tuberculosis in which the local lesions disappeared when appropriate topical rem-

edies were employed in combination with general and hygienic treatment. An accurate diagnosis having been made of the local lesion, and a remedy best suited to its condition having been selected, the larynx is rendered anesthetic by the application of a 10-per-cent solution of cocaine, all local treatment being applied with the laryngeal image in full view. At the meeting of the Section of Otology and Laryngology of the College of Physicians in December last, I reported four cases of diffuse laryngeal and tracheal tuberculosis diagnosed by the presence of the tubercle bacilli in the sputum, and relieved by the use of intratracheal injections of creosote-menthol solution in olive oil. I had the pleasure recently of giving a brief description of this method to the members of this society. If time permitted I would relate the history of these cases, but I hope to publish them in detail in the near future. In infiltration I have used with success, in three cases in which dysphagia was a prominent symptom, submucous injections of minimum doses of pure guaiacol or creosote with a special syringe. When ulcerations are present, nothing has been so successful in my hands as the local use of lactic acid after the method of Krause. The ulcers are first cleansed with Dobell's solution, afterward with hydrogen dioxide or 1-to-3000 mercuric chloride, and are then thoroughly rubbed every third or fourth day with a solution of lactic acid, 20 to 80 per cent. Heyring's treatment, by curetting the ulcerations before the lactic acid is applied, will be found of value in removing necrotic tissue, thus securing an efficient application of the acid. Orthoform applied by means of a powder-blower or in solution to ulcers with exposed nerve endings will be found very useful in relieving dysphagia, but it has no healing properties. A host of other medicaments, like aristol, acetanilid, iodoform, bismuth subgallate in combination with morphine and cocaine, have been blown into the larynx with varying success, but I have never found them of special value.

In dysphagia, Wolfenden's method of feeding, the patient being placed in the Trendelenburg position while he sucks liquid nourishment through a tube, will sometimes be found of use, though in extreme cases rectal feeding will have to be employed until the larynx is sufficiently improved by local treatment to allow the nourishment to pass painlessly over the epiglottis. Early tracheotomy, where the lung involvement is slight, has been urged by some authorities on the ground that absolute rest of the larynx is thereby insured, and topical applications are more easily made. It is indicated in impending suffocation.

SOME POINTS CONCERNING THE MORE MODERN CONCEPTION OF DISEASES OF THE HEART.[1]

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Any disease as it appears from decade to decade or century to century presents in the main the same phenomena, though of course there may be some modifications due to environment or to acquired relative immunity. But in general its features are the same. The interpretation of these phenomena, however, and the conception of the disease vary materially as facts hitherto escaping notice are recognized and as new discoveries in science permit of their application in solving the mysteries of the malady in question. To illustrate, typhoid fever is nearly the same to-day as it was in the early part of the nineteenth century, when no distinction was made between it and typhus. It is the same as when, a little later, Louis, Gerhard, and others made an anatomical distinction between the two diseases and drew more accurately its clinical picture. But how different is our conception of typhoid from that of a century or even twenty years ago. Bacteriology has shed a new light upon the picture, and the general impression made upon us is one entirely different. Etiology is clearer, complications hitherto looked upon as accidental are now recognized as secondary manifestations of the action of the specific germ, diagnosis has been made more sure, the disease is even known to exist without the commoner anatomical intestinal lesions, and the way to prevent it is clearly pointed out. It is the same disease as in the time of Louis, altered only because we have changed our point of view and are seeing it in a different and better light. And chemistry and physical chemistry may still further change the picture in the future.

A somewhat similar change has occurred regarding disease of the heart. The confused and misty notions that prevailed up to the third decade of the last century seemed cleared away by Laennec, who with the stethoscope laid the foundation for physical examination of the heart, and by autopsy learned how to interpret correctly the bedside findings. Heart disease was looked at now from the point of view of physical examination and the mechanical effects due to deformed valves. Skoda, Traube, Stokes, Walshe, Flint, and others perfected this method until it became so wonderfully exact that it has been little improved upon by later investigators.

[1] An address delivered before the Medical Societies of Berrien and Cass counties, Michigan, at Niles, Michigan, Dec. 12, 1901.

But the effect of Laennec's teaching and that of other masters has been to cause the mass of physicians to look upon the valves of the heart as the main part of this organ, at least from the standpoint of disease, and to regard the murmur as the essential finding from the standpoint of diagnosis. And only gradually have we come fully to realize that important as are the valves they are useless without a good heart muscle, and that the murmur is but one of the means of physical diagnosis of cardiac disease, and that it may be, as it often is, of secondary importance. In other words, we are looking at the heart in a new light; we are getting a more comprehensive view of the diseases of this organ.

Bacteriology has shown us more clearly how certain cardiac affections arise, and it has given us a new conception of the acute inflammations, forming in our minds in these latter cases pictures not so much of a mechanical difficulty as of a septicemia and a toxemia.

I have thought it might be well in this paper to call attention to some of these facts that cause us to look at disease of the heart from a new view-point, and I will speak briefly to the following points:

1. The importance of other signs than murmur in the diagnosis of valvular disease.

2. The importance of a consideration of the condition of the muscle in cases of cardiac disease.

3. The importance in the same way of considering the condition of the pericardium.

4. The conception of acute endocarditis as an infectious process.

5. The impossibility of drawing a sharp line between acute benignant and malignant endocarditis.

6. The possibility of healing of acute ulcerative endocarditis.

I. Valvular endocarditis at times can be, at times must be, diagnosed by signs other than murmur. The murmur may be temporarily or permanently absent, adventitious sounds in the pleura, pericardium, or bronchi may obscure it, or the action of the heart may be so rapid and tumultuous and the murmurs so numerous and complex as to defy accurate analysis. Under these circumstances, therefore, one is obliged to rely on other signs, as also in the differentiation between murmurs due to valvular disease or organic lesion and the so-called accidental or functional murmur.

Many aids may be found in cases by inquiry into previous history, by evidences of cardiac incompetency such as cough, cyanosis, dyspnea, edema, etc., by interrogation of the kidneys and the peripheral vascular system. But I would call attention briefly to

the following points that among others should be investigated in every case of suspected valvular lesion:

(*a*) The size of the heart. Back of the obstruction and in a cardiac sense a leak as well as a stenosis is an obstruction, and the heart enlarges. Aortic disease means left heart enlargement, mitral disease left auricular and right ventricular enlargement. Later, of course, hypertrophy and dilatation may extend still further back until the right heart dilates, the tricuspid leaflets fail to meet, and a leak is present in this valve. And practically in mitral disease, either stenosis or regurgitation, we find an enlargement of the left ventricle as well as the left auricle, for reasons that need not be gone into here. This enlargement of the heart, then, as made out by percussion and the location of the apex impulse, is of greatest importance from a diagnostic standpoint, and when demonstrably absent is a strong argument against the presence of a valvular lesion, at least in any clinical sense.

(*b*) The alteration of the cardiac tones is often significant. In mitral disease the damming back of blood into the pulmonary circuit with the vigorous pumping of the hypertrophied right heart results in both an active and a passive overdistention of the pulmonary vessels. The pulmonary valves therefore close with an unusual snap under the high pressure, and this causes the accentuation of the pulmonic second tone. And where the left ventricle is but imperfectly filled, as in mitral stenosis, the aorta is likewise but imperfectly filled, the systemic vascular pressure is low, and the aortic closure is feeble and less intense than normal. The contrast under these circumstances between the sharply accentuated pulmonic closure and the feeble aortic is striking, and is extremely valuable if rightly interpreted as an indication of some form of mitral disease, just as the opposite condition—the sharp, ringing, aortic tone indicative of high systemic tension—leads one to suspect general arteriosclerosis or renal disease. The pulmonic closure is often so sharp that the shock of the closure of the valves can be palpated—"palpable second tone"—and this is aided by the fact that the overlying lung may be pushed aside by the enlarged heart so that the valves come closer to the chest wall.

The first tones are also to be studied. A loud and booming first tone is heard many times in the bovine hypertrophy of contracted kidney. A muffled first tone with a heavy apex impulse and an enlarged heart is common in aortic regurgitation. And among the most striking characteristics of mitral stenosis where murmur and thrill may be lacking is a sharp, snappy first tone, resembling in its

quality an accentuated second tone, and, if one is careless, readily confused with it.

Palpation may reveal thrills. Without a basic thrill a diagnosis of aortic stenosis is risky. A presystolic thrill at the apex seldom means anything else than mitral stenosis. The tapping apex impulse of this latter form of lesion is also noted on palpation. And in general the location and character of the apex impulse help as to the knowledge of the size of the heart and its muscular efficiency. Here may be included also the study of the pulse so characteristically of water-hammer quality in aortic regurgitation, small in the stenoses, and, in mitral stenosis when incompetency has set in, so apt to be rapid and irregular as well as small.

The capillary pulse and the peripheral tones in aortic regurgitation are not to be overlooked as aids. And where question of a valvular lesion due to sclerosis rather than true endocarditis arises, the scrutiny of the peripheral vessels for evidence of thickening is of course helpful.

Many other points might be named—the reduplication of tones, the retraction of the chest wall, the study of the venous pulse in the neck, etc.—that at times give the clew to the diagnosis. And the right heart lesions, while rarer, permit of similar study. This question of the secondary signs of valvular disease deserves more extended treatment than can here be accorded it, for it is an important one and one that often has to be learned by practice, because while lecturers and text-books mention all these facts, nevertheless the impression carried away by the average student is that the murmur is the *sine qua non* from the diagnostic standpoint, just as in his conception of scarlet fever the rash looms up before him as the one feature on which the diagnosis rests, until he some day has to make his diagnosis without a rash or with an atypical rash, on other symptoms, such as onset, throat, fever, rapid pulse, tongue, etc. One who has not tried to diagnose a valvular lesion without paying attention to the murmur will be surprised to find how often it can be done, and he will be pleased some day when he feels the pulse and puts his hand over the patient's precordia and declares that the lesion is mitral stenosis, for he has found a small, rapid, irregular pulse, a tapping, snappy apex impulse, a palpable pulmonic closure, and a presystolic apical thrill, and feels sure of his ground by palpation alone. You have heard of the English physician who in walking through the ward and seeing the big toe of a new patient sticking out from under the bedclothes gave it a pinch, and feeling the quick typical pulse of Corrigan, exclaimed: "Ah, indeed, aortic regurgitation!"

II. After all, what matters it if a man have a leak at a valve so long as the heart does its work and answers all ordinary demands? The important question is whether or not the muscle of the heart is intact and is competent to do its work, and to make up by an increase in force for the defective valve. It is trite to tell you that patients often live for years and even many decades with loud murmurs and characteristic pulses and hypertrophied hearts, all because they have good heart muscles. But as a matter of fact, where there is valvular disease there is apt to be myocardial disease, both due to the same cause or the one secondary to the other. And more than this, the pericardium often shares in the inflammatory process that attacks the endocardium. So true is this, and so important is it to direct our attention not to the endocardium or myocardium or pericardium alone, that Jürgensen has placed in heavy type this sentence: "Pancarditis ist die Diagnose der Zukunft." If we could train ourselves, therefore, not to look at a heart from the standpoint of a murmur alone or of a valvular lesion alone, but as a whole, and particularly if we could accustom ourselves to ask in every instance not only what is the valvular lesion but what is the condition of the heart muscle, we should have a much more comprehensive view not only of each individual case, but of heart disease as a whole.

We should suspect myocardial weakness, degeneration, or inflammation especially when a large heart is weak, irregular, with unduly slow or rapid action unexplained by other causes, such as valvular lesion, and where symptoms of incompetency appear on slight or no provocation. Light may be thrown on the condition of the myocardium by the condition of the peripheral vessels and a study of the valvular lesions, for we know how often fibrous myocarditis is met with in connection with aortic valvular lesions, with sclerosis of the aorta and coronary and peripheral vessels, and with angina pectoris. It is often impossible to differentiate between fatty and myocarditic heart.

The reason why our digitalis and rest do not take hold in a given case is because the heart muscle has gone to pieces. And you know that in your case of aortic regurgitation with dyspnea, congested liver, and edema you are inclined to give a far more grave prognosis than in a mitral regurgitation with even severer and more threatening signs of incompetency, for you are fearful that in the aortic case there is not only sclerosis of the valve but of the coronary vessels as well, and that fibrous changes in the myocardium have resulted so that it is incapable even by rest and stimulation of again recovering its tone. In many cases the myocardial disease even from the begin-

ning overshadows in importance the valvular; in fact, valvular lesions may be lacking except such as are due to relative insufficiency from widening of the chambers of the heart. And in nephritis the importance of the muscular integrity is clearly seen, cardiac symptoms remaining in the background until from its overstrain, overwork, or muscular degeneration the heart muscle gives out and valvular murmurs appear with signs of incompetency.

These are but hints, rather random at that, but serving, I trust, to emphasize the necessity of a consideration of the muscular condition in all cases of heart disease.

III. While inferior in importance to the endocardium and myocardium, the pericardium should never be overlooked in a study of a case of cardiac disease. There is no need to dwell upon the gravity of acute pericarditis as it complicates pneumonia or rheumatism. And slight or extensive pericardial adhesions may seriously interfere with the action of the heart, leading to hypertrophy and deformity, and also to secondary changes in the underlying myocardium. This is particularly true where not only the pericardium but the adjacent pleura and mediastinal tissue have become inflamed. In all cases of heart disease, therefore, in children as well as in adults, signs of adhesive pericarditis should be sought for, such as systolic retraction of the chest with sharp diastolic rebound, undue fulness and pulsation in the veins of the neck, paradoxical pulse, immobility of the apex impulse with change of position, fixedness of the pleura as shown by unchanging area of cardiac dulness on deep inspiration.

The topic as I have treated it thus far deals with chronic lesions of the heart, though they may of course have resulted from a preceding acute inflammation. Most of the facts, too, are explicable on mechanical grounds, and we are still looking at the heart from the mechanical point of view, though I trust not from that of the valve alone or of the murmur alone. When we come to consider acute endocarditis the mechanical feature sinks to a position of secondary importance, sepsis and toxemia appear, and we must look upon the disease as a septicemia or pyemia with a localized manifestation on the valves. I need not weary you with statistics to prove that acute endocarditis is mycotic in origin. Its occurrence in connection with infectious diseases such as rheumatism, pneumonia, gonorrhea, diphtheria, pyogenic sepsis, suggests this origin, and repeated examination of the blood during life and of the valves after death have revealed microörganisms in the blood and on the valves. This is true of the acute benignant as well as ulcerative forms. In some cases, however, no germs have been found, and this has sug-

gested the explanation that the endocarditis is due either to undiscovered germs or to toxins—*e. g.*, in some cases of rheumatic endocarditis. Acute endocarditis is occasionally apparently primary—*i.e.*, the germs have entered the circulation through some unrecognized port of entry, leaving no trace of its position by local sign. Generally, however, some local inflammatory trouble is present, as a mastoiditis, cholecystitis, gonorrhea, or a more general infection, as rheumatism, pneumonia, scarlet fever; and we readily understand the presence of the germs in the blood. Furthermore, many observations have shown that valves previously damaged by inflammation are prone to have it relighted by subsequent infections, and that valves the seat of sclerotic changes can in similar manner have an inflammatory process implanted upon them, thus bearing out by clinical observation the experimental work of Rosenbach and others, which showed that when microörganisms were injected into the blood of a lower animal they were more likely to lodge on the valves of the heart if the valves had been previously damaged.

Clinically there are generally recognized two types of acute endocarditis—the benignant or vegetative, and the malignant or ulcerative. But no one is able, except artificially, to draw a sharp line of demarcation between them either clinically or post mortem, for they are both infectious in origin and pass imperceptibly the one into the other in their clinical phenomena, and the autopsy reveals all shades of changes, from the little, red, innocent-looking warty fringe along the edges of the valves, to the huge, polypus-like masses with crater-like excavations with perforated and destroyed valves, and damaged neighboring endo- and myocardium.

The one clinically and anatomically corresponds to the conception of the benignant type; the other is plainly ulcerative. But clearly, it is illogical to differentiate on the basis of recovery or death—if the patient dies, ulcerative; if he lives, benignant. For clinicians and pathologists are now of one mind in believing that cases of the malignant type may recover. So while practically and from the point of view of prognosis and perhaps of therapy we may benefit by keeping in mind the distinction between the disease with the benign tendency and that with the malign, we must, until bacteriologic or toxic differentiation is more perfect, regard all these cases as infectious and as one and the same disease. We do the same thing with scarlet fever and pneumonia. One patient is ill with mild scarlatina and another has the disease in a virulent form. Our prognosis and our therapy may differ in the two cases, but our conception of the two diseases as an infection is the same, and we

interpret the different manifestations as meaning differences in number or virulence of organisms, in the resisting power on the part of the patient, or in ability to eliminate the toxins of the disease. When it becomes possible to identify more readily and certainly the microörganism or the toxin that is at fault in a given case of endocarditis, we may be able to see clinical differences between a rheumatic, streptococcus, staphylococcus, pneumococcus, gonococcus endocarditis that we do not now recognize, and to differentiate with reasonable probability a pneumococcus from a staphylococcus endocarditis as we now do in the case of a croupous and a bronchopneumonia. In fact, something has already been done in this line. Netter believes it is the pneumococcus form that though very severe may heal; and Harbitz in particular has drawn attention to the differences between the streptococcus and staphylococcus infection of the valves, the latter, strange as it may seem, appearing the more malignant and the more prone to be accompanied by severer local, distant inflammatory and destructive processes.

I have referred to the possible healing of ulcerative endocarditis. Numerous writers have referred to this, among them Samson, Mackenzie, Gilbert Smith, Nelter, Landouzy and Siredey, Galliard, Eichhorst, and many others. Doubt is often thrown on the diagnosis of malignant endocarditis when recovery occurs, but with no more justice than in the case of desperate alcoholic or senile pneumonia that, contrary to expectation, recovers. Take one of Eichhorst's cases, a woman of 36, who after confinement was taken with fever, cardiac murmur, typhoid state, ecchymoses, arthritis, symptoms of renal infection, and recovered after five months with a mitral insufficiency. If she had died there would have been no question at all as to postpartum sepsis with valvular localization. In Chicago alone I know personally of three cases regarded by competent physicians as malignant endocarditis with recovery—one a case of Dr. E. F. Wells and R. H. Babcock, in an adult following pneumonia. Dr. N. S. Davis, Jr., reported a case at the meeting of the American Medical Association in 1900. I have seen a child of three with pneumococcus septicemia causing sore throat, otitis media, bronchopneumonia, develop a heart murmur, an irregular pulse, have subnormal temperature at times, then chill and temperature of 105° (this repeated on several occasions), petechiæ appearing on the skin twice, and recovery following only after weeks of slowly fading slight fever, the mitral valve now, two years after, being the seat of a definite leak with secondary cardiac hypertrophy.

But we are not obliged to rely only on bedside observation for

proof of recovery. Hearts are occasionally seen post mortem in which a scarred valve shows an old perforation of a valve with smooth, healed edges, a condition that could only come from a preceding healed destructive—*i.e.*, ulcerative—inflammation, with resulting aneurism of the valve and rupture of the same. Such a heart I am able to show you through the kindness of my friend and colleague Professor Hektoen.

The general question of diagnosis I pass by, as it is fully gone into by all good text-books. I will add just a word as to the commoner causes of error in diagnosis as they have been seen by me in practice.

The fulminant type of the disease, where there is a sudden overwhelming infection, with chills, fever, delirium, multiple inflammatory or suppurating foci with death in a few days, may be recognized only by the discovery of the infection atrium, the evidence by physical examination of valvular involvement, and the lodgment of emboli in spleen, kidney, skin, or peripheral vessel. And at times the murmur may fail, as in a case cited by Potain[1] of a woman who, following confinement, presented intense fever, chills, and all the evidences of acute ulcerative endocarditis except murmur. At the autopsy there was found ulcerative endocarditis that had caused the formation of a large thrombus, which filled the left auricle and projected into the mitral orifice.

The resemblance to malaria should lead to no mistake after time has been given to examine the blood for leucocytosis, which is often present in the malignant endocarditis but absent in malaria, to examine for plasmodia, and to resort to free use of quinine. The greater irregularity of the temperature, the petechiæ, and the cardiac findings are also to be noted.

Many cases pass for typhoid. In onset, fever, splenic enlargement, mental apathy, delirium, the resemblance may be striking, and the spots may be misinterpreted and taken to mean typhoid. The diagnosis may of necessity be held in abeyance for a few days, when it will commonly be found that the temperature is not of the typical remittent type of typhoid, the pulse is unduly rapid, the heart shows murmurs that may change in character from day to day, embolic phenomena appear, petechiæ make their appearance. The blood generally shows leucocytosis, microörganisms other than typhoid germs, and gives the Widal serum reaction. In many of these cases there is a knowledge on the part of the family and of the physician that an old valvular lesion exists. Instead of leading one to suspect

[1] *France Médicale*, No. 43, April 9, 1889.

something else than endocarditis, this should always arouse the suspicion of an acute exacerbation of the old trouble or of the implantation of fresh germs in the already injured valves. Old sclerotic valves that would seem to be innocent except that they may cause a mechanical interference with circulation may furnish the nidus for most virulent acute inflammation.

Perhaps most puzzling of all are the cases with a long subacute course extending over months, the patient not bedridden, but having a slight temperature with irregular sharper rises, chills or chilliness, becoming anemic, with only occasional crops of petechiæ or emboli, as in the spleen, to give a definite hint as to the nature of the obscure sepsis that often suggests concealed tuberculosis.

I have aimed in this paper to give only a few hints that seemed to me of practical value. If any one of them helps toward a broader and more accurate knowledge of diseases of the heart the object of the paper has been accomplished.

SOME OBSERVATIONS ON THE EFFICACY OF NARGOL IN OPHTHALMOLOGIC PRACTICE.[1]

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Nargol, one of the more recent organic silver preparations, is a chemical combination of nucleinic acid and metallic silver. Like other albuminates of silver, it is an attempt to provide a non-irritating, non-coagulating, and non-caustic substitute for silver nitrate.

From clinical experience it would appear that all silver preparations are irritating in proportion as they are unstable, but on the other hand, the facility with which the nitrate combines with albuminous fluids has been used to explain its success in the catarrhal conditions succeeding gonorrheal and other pyogenic infections.

Chemically speaking, the common feature of these agents is metallic silver, and in this connection it is interesting to note the amount of that metal found respectively in an ounce of silver nitrate, nargol, and protargol. Silver nitrate contains 304.8 grains by weight or 63.5 per cent, nargol 48 grains or 10 per cent, and protargol 39.8 grains or 8.3 per cent.

It would appear, other things being equal, that the preparation of this class containing the most silver and causing the *least reaction* should prove most valuable.

Having used protargol extensively, and believing that it met these conditions best, I began a systematic comparison of these two preparations in solutions of equal strength, employing nargol in one eye and protargol in the other, where both eyes were involved. Free application to both upper and lower retrotarsal folds and conjunctivæ was made by means of a thoroughly saturated medium-sized cotton applicator. The upper fold was exposed for treatment by upward and backward pressure upon the eyeball in the manner recommended by Dr. Hotz. My first experience with nargol included forty cases, divided as follows: 10 of chronic and acute conjunctivitis; 8 of phlyctenular conjunctivitis; 2 of follicular conjunctivitis; 2 of vernal catarrh; 10 of blepharitis; 6 of corneal ulcer; 2 of gonorrheal conjunctivitis.

A comparison of nargol with silver nitrate or protargol was made in the foregoing, where it was possible, and in the main the results were satisfactory. In all the cases of phlyctenular and follicular conjunctivitis 20-per-cent solutions of nargol were employed.

[1] Read at the meeting of the Chicago Ophthalmological Society, Feb. 11, 1902.

In the treatment of four cases of blepharitis of the ulcerative type, nargol, in 25-per-cent solution, was not a success, and in the simple form it was slightly inferior to nitrate of silver. In the treatment of corneal ulcers, 20- and 25-per-cent solutions gave good results, even when compared with 2- and 4-per-cent solutions of silver nitrate. In the gonorrheal infections nargol in 25-per-cent solution was employed twice daily during the first three days, and thereafter once every day. These cases were not severe, were seen early, the treatment was without special incident, and recovery occurred in two weeks. In all of the remaining cases 10- and 20-per-cent solutions were found most serviceable, and unlike silver nitrate, caused no agglutination of the lids on the morning following first applications.

Having satisfied myself as to the general value of nargol in the foregoing I began a comparison of nargol and protargol solutions of equal strength with a view to learning more of their irritating properties.

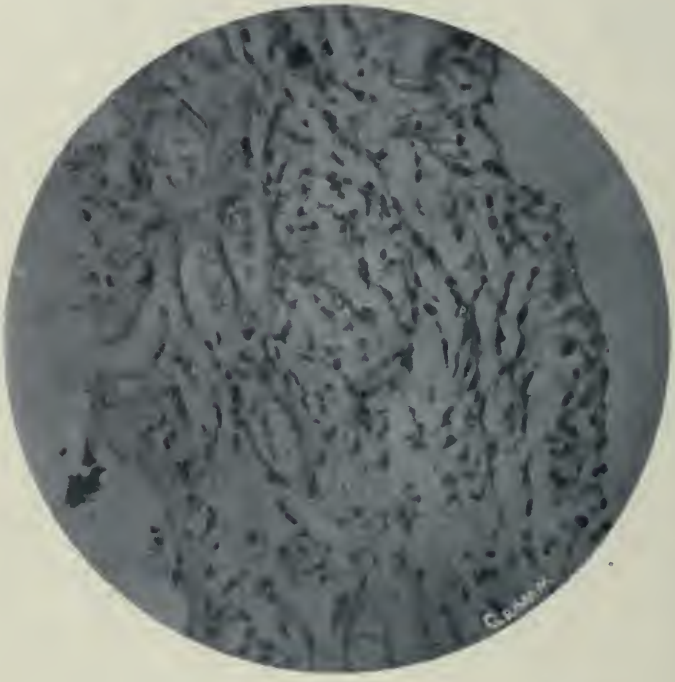
These experiments extended over *200 cases*, nargol being used in one eye and protargol in the other, and under the same conditions, as nearly as possible. Solutions ranged from 10 to 20 per cent, and a fairly accurate idea was obtained of the amount and persistence of pain and injection. The following is a brief summary of the facts elicited from the above 200 cases: In 20-per-cent solutions, series of 60 cases, *pain* and *injection* decidedly greater and more *persistent* from protargol; in 15-per-cent solutions, series of 60 cases, pain and injection decidedly greater from protargol; in 10-per-cent solutions, series of 80 cases, pain and injection slightly greater from protargol; 20- and 30-per-cent solutions of nargol cause only moderate pain, and slight injection; 10- and 15-per-cent solutions of nargol cause slight degree of pain of average duration of two minutes, and very slight injection.

All of the above solutions of nargol cause very decided blanching of the conjunctiva.

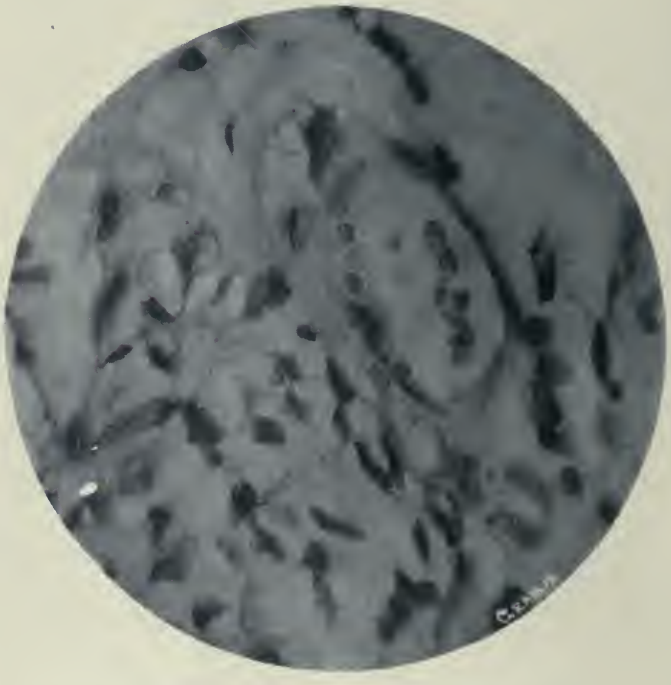
My general conclusions are as follows:

Nargol is relatively non-irritating, has considerable range as an astringent, as well as superior penetrating power, stability, and solubility, and is most efficient in 10- and 20-per-cent solutions, which should not be kept more than five weeks. The addition of a few drops of a one-per-cent chloretone solution retards decomposition. In solutions of equal strength nargol is more stable and less irritating than protargol, and appears to be equally efficient.

103 State Street.



No. 1.—Transverse section sarcoma of iris. Magnified 87 diameters.



No. 2.—Smaller area from No. 1. Magnified 375 diameters.

PRIMARY SARCOMA OF THE IRIS.

BY ALBERT B. HALE, M.D.,
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Sarcoma of the iris presents an exceptional type of the disease in the fact that it is a relatively benign tumor. In the literature cases are reported in which a sarcomatous growth has been removed from the iris, and where the previous history of the patient was such that no suspicion could be entertained that the tumor was of metastatic origin. Long observation of these cases, after the removal of the tumor, demonstrates that recurrence is much less frequent than in other structures.

Dr. Casey A. Wood is at present engaged upon an exhaustive collective investigation of new growths of the iris. Not wishing to intrude upon his analysis of these pathologic conditions I merely report the case which I have observed, placing upon record one more example of these tumors which can be added to those already published.

B. S——, a young woman 22 years of age, single, and by occupation a cigarmaker, was first seen at the dispensary of the United Hebrew Charities. For two weeks before applying for treatment there had been pain in the right eye. There was some localized redness in the eyeball, which she attributed to taking cold. There were no signs of conjunctival inflammation, but at the sclerocorneal junction in the lower outer quadrant of the right eye ciliary injection was marked; the cornea itself was clear. The iris reacted well to light and accommodation. In the lower outer quadrant of the iris a small swelling was seen, which did not reach the ciliary or pupilary edge. The growth was of a tawny yellow color, in marked contrast to the dark brown of the healthy iris. Tension was increased, and pressure on the globe caused some pain. Myopia was present, although the patient had never worn glasses. Vision in the left eye was 4–100, which was raised to 20–70 by 12 D. In the right or affected eye vision was 2–100, which was raised to 20–100 by 12 D.

The patient was sent to the hospital, where a thorough examination was made. The tuberculin test was used, and large doses of iodides taken, all with negative results. May 1, 1891, three weeks after the first pain appeared in the eye and one week after the discovery of the tumor, it was removed. The iris was excised to its ciliary border, the incision being made everywhere through healthy

tissue, the tumor seeming to have a capsule. Healing followed promptly with a complete disappearance of all the symptoms. Three months later the vision in the left eye was the same, the right having recovered equal acuity with the left. The patient used at her work concave 5 D. for each eye.

Six months after the operation was performed there were no indications of involvement of the orbital contents, although the patient was under daily observation. She is improved in flesh and is quite well. The coloboma is large and through it the edge of the lens can be easily seen, with some of the ciliary body, but nothing abnormal is discoverable. The microscopic examination at the Laboratory of the Rush Medical College confirmed the clinical diagnosis of sarcoma.

103 STATE STREET.

A FATAL CASE OF HEAD-TETANUS FOLLOWING EYE INJURY.

BY C. P. PINCKARD, M.D., CHICAGO,

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On June 19, 1900, David H——, a boy of 14, was experimenting with a toy cannon. After putting in the powder, he filled the cannon with paper, small stones and dirt. This dirt was scooped up in handfuls from an old cedar-block pavement which had been in place for many years, and was in such bad repair that many of the blocks had been torn up and ground to small pieces by the heavy teams passing through the street. On being discharged the cannon burst, and something struck the boy in the left side of the face and in the left eye. This happened about 4.30 P.M.

After some delay the boy was taken to the Michael Reese Hospital, where I first saw him at 8 P.M. The left side of the face was sprinkled with embedded powder grains. The lids and conjunctivæ showed nothing remarkable. Through the cornea there was a clean cut about four millimeters long, a trifle above the center of the pupil. Directly behind this cut was a similar opening in the lens, from which protruded opaque lens substance in considerable amount. This so covered the pupilary margin that it was impossible to see if the iris were torn. There was, however, no blood in the anterior chamber. Owing to the opaque lens, the fundus could not be made out.

There were no means of telling what had struck the eye, but from the clean-cut appearance and the size of the corneal wound it was thought that a pebble had penetrated. Atropine was instilled frequently, and all went well until about noon of the following day, when it was noticed that the eyeball began to bulge forward, with a slight swelling of the lids. The proptosis increased rapidly, and by evening it was so marked that the lids were tensely drawn over the eyeball. The corneal wound still remained perfectly clean, however, and there was but little edema of the conjunctiva.

From the symptoms it was concluded that the supposed pebble had passed completely through the eyeball and was lodged in the orbit, causing inflammation of the post-ocular tissues. Iced compresses were ordered, in addition to the atropine.

By the next afternoon the corneal wound began to show signs of infection, and the conjunctiva became edematous. These symptoms increased so much the next day that it was decided to open into the

orbit through the upper lid, and if possible remove the foreign body. Early on the morning of the 23d the corneal wound had become a slough, and the edema of the conjunctiva so great that it protruded between the lids.

An incision nearly an inch long was made just under the eyebrows, and by blunt dissection was carried back into the orbit well behind the eyeball. A few drops of pus were evacuated, but the most patient probing failed to detect a foreign body. It was then thought that the foreign body was in the eye, and enucleation was decided upon. With considerable difficulty, owing to the swelling and the adhesions which had formed, the tissues were dissected from the globe. As the dissection reached the posterior part of the eyeball, a dark mass was seen sticking through the sclera. Pressure on the globe caused this to pop out, accompanied with watery fluid and pus. On examination, much to our surprise, this proved to be a piece of rotten wood, considerably softened by the fluids of the eye. It came out in two pieces, one considerably larger than the other, the line of division being "with the grain" of the wood. On carefully matching the two pieces later, and gluing them together, the fragment was found to be four millimeters long, three millimeters wide, and one and a half millimeters thick in the greatest dimensions. When dry it weighed exactly one-half grain! It was of coarse grain, much blackened by exposure, and was evidently a piece of one of the cedar blocks from the pavement.

Following the enucleation, the orbital tissues were flushed with hot water until all bleeding ceased. For the next thirty-six hours the conditions seemed favorable, and it was expected that the case would run the usual course and be discharged in a few days.

Late in the afternoon of the 24th the house surgeon noticed a drooping of the right eyelid, and that the left side of the face was paretic. The patient complained that when he opened his mouth there was pain in the right jaw, the right being free. The mouth could be freely opened and the tongue protruded, but it deviated to the left side.

At 9 P.M. there was complete paralysis of the left side of the face, complete paralysis of the branches of the third nerve on the right side, except those to the iris and ciliary muscle. With the possibility of tetanus in mind, the masseters were examined through the mouth, but there was no rigidity; the jaws could be well separated, and there was no pain except when the mouth was wide open. The patient was restless, and chloral and bromide of potassium were given. Temperature 98.2°; pulse 66; respirations 24.

At 1 A.M., June 25, the patient screamed for the nurse, complaining of severe pain in the jaws. The mouth could be opened only about one-half inch. At 9 A.M. trismus was well marked, so that the teeth were tightly clinched, the masseters being rigid. The muscles of the back of the neck were so tense that the patient could not depress the chin more than one-quarter inch. There was great pain in the jaw, with pain and dryness of the throat. Risus sardonicus was well marked; also rigidity of the rectus abdominis. Temperature 97.2°; pulse 72; respirations 24. Thirty grains of bromide and five grains of chloral, together with one-half grain of morphine, were ordered, this to be repeated every half-hour until symptoms abated. At 12.30 P.M. fifty cubic centimeters of antitetanic serum was injected into the muscles of the back. By 1 P.M. the trismus had almost disappeared, and the patient was quiet. Temperature 98°; pulse 76; respirations 22. At 4 P.M. temperature was 97°; pulse 124; respirations 24. Up to this time there had been given 180 grains of bromide, thirty grains of chloral, and four grains of morphine. The trismus was gone, the masseters relaxed, and the patient resting. The only additional symptom noticed was complete ophthalmoplegia of the right eye, with small pupil (probably from the morphine). A sterile glass tube was passed into the orbit as far as the apex, and through this tube was passed a platinum wire and a smear of pus extracted.

At five o'clock the pulse suddenly rose to 140, temperature 99.6°; by 8 P.M. the pulse had dropped to 114, the temperature being 100.8°. The patient was restless, tossing about in the bed, and trismus again made its appearance. One-half grain of morphine was injected and repeated at 10 P.M. Soon after the boy fell asleep, but the pulse was 144. The pulse and temperature rose gradually; by 5 A.M., June 26, the pulse was 154 and temperature 105°. From this time until 10 A.M. the temperature gradually fell to 103.8°, but the pulse remained above 150. Temperature and pulse began to rise again, and at 12 o'clock temperature was 106°; pulse 176. At 2 P.M. temperature was 106.4°, pulse 160; at 3 P.M. temperature 107°, pulse 164; at 4 P.M., temperature 109°, pulse 192. From this time on until death, which took place at 5.15 P.M., the pulse could not be counted.

Several times between midnight and the time of death it was necessary to give morphine because of the severe symptoms. From 10 A.M. of June 25 to 5 P.M. of June 26—that is, in nineteen hours—ten grains of morphine were given.

While the lessening of the convulsions after the injection of the

serum at 12.30 A.M., June 25, may be due to the antitetanic serum, it must be borne in mind that the large doses of morphine were undoubtedly much more effective. It will be noticed from the record that as the effects of the morphine wore off the trismus and other tetanic symptoms increased.

Consciousness was retained until noon of the 26th, but was absent during the last five hours of life. During the last twelve hours of life tetanic spasms took place at the slightest touch.

The pus from the apex of the orbit was unfortunately not properly examined, and consequently nothing could be determined from it. Half of the piece of wood was given to Dr. Fütterer, and cultures made from it showed the presence of the tetanus bacillus.

From an ophthalmologic standpoint, the chief interest in the case lies in the fact that such a light but bulky body could take the course of this piece of wood. It hardly seems possible that a comparatively large object, weighing only half a grain, could have sufficient momentum to pass through the tough corneal tissue, traverse the lens and vitreous, and then tear through the tough sclera. The case well shows the minor point, that inflammation makes its appearance much sooner in the orbit than in the eyeball.

From a general surgical standpoint the case seems interesting, because it corresponds so accurately with the more recent descriptions of head tetanus. The method of infection, the rapid onset of the symptoms, the paralysis of the facial of the same side, with paralysis of a cranial nerve other than the facial of the other side, the involvement of the throat and neck muscles, the trismus, and the rapidly fatal course of the disease, leave but little room for doubt as to the diagnosis.

The writer wishes to acknowledge the kind assistance of Dr. L. A. Greensfelder.

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DIAGNOSIS AND TREATMENT OF CANCER OF THE RECTUM.

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Cancer of the rectum occurs as one of five varieties, involving different portions of the organ from the ano-cutaneous junction to the sigmoid. The tendency of malignant growths here, as elsewhere, is essentially toward fatality. Unfortunately the symptoms in the early stages of the disease are not in proportion to the gravity of the condition, hence a diagnosis is rarely made until the time for successful treatment has passed.

The anus, and the rectum for one inch above the anus, are highly sensitive, and in this locality pain is an early symptom. Unfortunately most of these cases are diagnosed as hemorrhoids, and are treated accordingly, to the detriment of the patient and of the reputation of the attending physician. Every local disorder of the rectum should be examined digitally and with the eye. If there still remains a doubt, the laboratory will decide the point beyond peradventure. It is a simple matter to cocainize the involved region and remove a small piece of the growth for examination, or in a disease of such gravity general anesthesia for the same purpose is not only permissible, but positively indicated.

In the varieties of cancer which involve the rectum above the anal region, pain is not an early symptom, but its absence should not lead to error. The earliest symptom is a discharge of blood and mucus or blood-stained mucus. The patient frequently ascribes this to diarrhea. If in addition there is a history of alternating constipation and diarrhea, we should be suspicious and make the necessary investigation. If we miss the diagnosis at this stage and allow the growth to proceed until the submucous layers and lymphatics are involved and the lumen of the gut is so diminished that the stools present the characteristic ribbon-like appearance, we will be too late to save the patient's life, and can only hope to prolong his days by some palliative measure.

The five varieties of rectal cancer met with are: Epithelioma, scirrhous, encephaloid, colloid, and melanotic carcinoma, called by some sarcoma.

Epithelioma occurs as one of two varieties, the first having the appearance of epithelioma of the lip and showing under the microscope the characteristic pearly bodies or nests of cells. Its origin is at the cutaneous margin of the anus, and it tends to involve the skin

rather than the mucous membrane of the anus. Its early appearance is that of a sessile, dry, warty nodule, and ulceration appears late in its course.

The second variety of epithelioma is the commonest form of cancer met with in the rectum; it is known as adenocarcinoma, or cylindrical epithelioma. Its origin is in the mucous membrane of the anus or just above the sphincter; it tends to spread upward into the rectum, and rapidly involves the deeper tissues. This is the variety of cancer so commonly mistaken for hemorrhoids and fissure of the anus. In its early stages the growth moves freely with the mucous membrane from which it springs. Late in the disease the tumor presents a soft, friable mass, with spots of ulceration, having raised edges and hard bases. Bleeding is, at this stage, a marked symptom. Lymph glands of the groin, pelvis, and behind the rectum are early involved. Dispensary surgeons and physicians, who see large numbers of patients in a few hours, should be careful not to ascribe all inguinal and saphenous adenitis to venereal disease or stumped toe, but investigate the rectum in patients so afflicted.

Scirrhus is the next most common variety, and is frequently confounded with benign or fibrous stricture of the rectum. It has its origin in the submucous layer of tissue, and in its early stages the mucous membrane will slide over the mass. It is hard, and tends to spread in the long axis of the bowel, and, according to Moore, in the line of the arteries and lymph channels. It involves eventually the entire circumference of the bowel and gives rise to symptoms of obstruction. The history is of great importance in establishing the diagnosis. "The hardness and contractility of this form of the disease are the chief clinical facts upon which the diagnosis rests; and yet, leaving out of consideration the history of the case, it will often be impossible to distinguish between the gross appearance of scirrhus and those of simple fibrous stricture" (Kelsey, page 376).

Encephaloid is a growth of the glandular tissues of the mucous membrane. It grows rapidly and may attain an enormous size. It is very vascular, and when it breaks through its connective tissue capsule may have the appearance of brain tissue, or be spongy, like placental tissue. It is rich in cancer juice. It has a tendency to return rapidly. Sometimes it is so soft as to suggest fluctuation, may be mistaken for abscess.

Colloid, or alveolar carcinoma, closely resembles the last variety, differing in the character of the material found in the areolar meshes: this material is yellowish, translucent, and jelly-like, containing cells of various sizes and shapes. It is less malignant than the other varieties of cancer met with in the rectum.

Melanotic carcinoma or sarcoma is a rapidly fatal and malignant form of rectal cancer. It is fortunately very rare, only eleven cases being recorded (Kelsey, page 378).

Cancer is a disease of adolescence and old age, increasing rapidly after the age of twenty. Pain in the growths about the anus is an early symptom, while in those situated higher up it only comes on late. It often arises from the passage of feces over an ulcerated surface, or from pressure of the growth. When the pain involves the lower extremity it is due to encroachment of the neighboring nerves, and is a bad sign.

Cancer is a disease of rapid growth, and here lies the great point of differentiation from benign fibrous stricture. If, in addition to the rapidity of growth, we have a corresponding loss of weight and and strength, and cachexia, and the patient gives a history of bloody mucous discharges with difficult defecation, our suspicion should be aroused, and a careful examination of the rectum be made. Ordinarily the history and a digital exploration will establish a diagnosis, but if it is impossible by these means to arrive at a definite conclusion, then the proctoscope should be employed and the rectum viewed by means of artificial light.

The treatment of cancer of the rectum depends upon the locality and stage of the growth rather than upon its character. In the advanced stages palliative measures are alone justifiable.

The immediate mortality of radical procedures is about 20 to 30 per cent, the causes of death being peritonitis, shock, and retroperitoneal infection with resulting septicemia. Of those who survive the operation, about 10 per cent remain free from recurrence of the disease after one year. Of this 10 per cent who do not have a return within a year, very few remain perfectly well for a period of four years or longer. The statistics of the operation are confusing and difficult to estimate; but it is the opinion of such authorities as Kelsey, Allinghan, Kaskey, Bellroth, Cripps, Bryant, and Hildebrandt that the radical operation is not hopeful in the majority of cases. Dr. McCosh, in a paper read before the New York Surgical Society, analyzed four hundred and thirty-nine reported operated cases. The immediate death-rate was 19.1 per cent; of the remainder, thirty-two cases, or 10 per cent, showed no recurrence in four years. It is difficult to properly value these figures, as the nature, location, and stage of the disease are not mentioned.

If 10 per cent of those who survive the operation remain free from recurrence after four years, then the operation is justifiable and should be instituted in selected cases.

Colostomy, the only alternative to the radical operation, has many able advocates, who claim for it equal prolongation of life with greater comfort and a decidedly lower death-rate. The objections to colostomy are the artificial anus and the consequent uncleanliness; but we must remember the loss of function of the natural anus in the stage of the disease when colostomy is indicated. Patients so afflicted have little or no control of the sphincter, and are as badly off as those who have an artificial anus in the groin or loin. In fact, they are in a more deplorable plight than he who has a daily stool through the anus in the groin, for the tenesmus and discharge from the rectum are constant. Kelsey has this to say: "Colostomy, especially inguinal colostomy, relieves pain, does away with the constant tenesmus and discharge from the rectum, which by their exhausting effects are the immediate cause of death; delays the development of the disease by preventing straining and congestion of defecation; prevents absolutely the complication of intestinal obstruction, which is another cause of death; enables the patient to sleep, eat, and gain flesh, and often makes him think himself cured in spite of the plainest statement to the contrary. Instead of passing his days and nights on a commode, wearing out his life in an effort to free his bowel from the irritation, he has one, or perhaps two, solid fecal evacuations from the groin in twenty-four hours. It is unpleasant to have the gut end in the left groin, but after a few days the patient will tell you that life, from having been a constant torment, has again become worth living."

Another important use of colostomy is as a preliminary to the operation for extirpation. It serves to build up the patient's resisting powers by increasing his nutrition and general health, and reduces the likelihood of septic infection by the absence of fecal matter in the rectum.

Local treatment of cancer of the rectum other than operation is of little avail, does not diminish the patient's suffering, and is attended by risk of perforation, hemorrhage, and shock.

The operations advocated for extirpation of the diseased portion of the rectum are numerous. The two which are in greatest favor to-day are Kraske's operation and its modification, and one which is applicable in the female; using the route of the perineum to gain access to the bowel. Dr. John B. Deaver has twice performed this operation at the German Hospital in the last six months with ease and success. Both patients recovered from the operation without complications, and so far have had no recurrence.

A median incision is made in the perineum down to the external

sphincter; a lateral incision is made in either ischiorectal region, and the anus dissected free and well back. The rectum is next separated in its entire circumference to well above the growth. Stitches are now placed in the healthy rectal tissues above the growth and left long, to serve as tractors. The gut is excised, and the upper end drawn down by means of the tractors and the edges sewn fast to the anus by four interruptured sutures of silk. The wounds in the ischiorectal fossæ are not closed, but a gauze drain is packed into each cavity and allowed to escape through the wound to either side of the anus. In Kraske's operation the removal of the coccyx and a portion of the sacrum gives a large field, allowing a high excision or amputation of the rectum and permitting a closure of the peritoneum. This incision enables the surgeon to excise the diseased portion of the gut and perform an end-to-end anastomosis; or, if the disease is so low down as to involve the rectum to the anal junction, the upper end of the gut can be fastened to the anus, thus preserving the action of the sphincter. If amputation is necessary, due to involvement of the anus, an artificial anus can be made by fastening the severed end to the external wound. This form of artificial anus can be readily controlled by a perineal pad supported by a belt around the waist.

Opium is indicated in some stages of the disease in nearly every case of cancer of the rectum; its use, however, should be deferred as long as possible. While it diminishes pain, it sooner or later loses its effect, and must be used in constantly increasing doses until the habit is formed, adding one more ill to the long list already endured by the sufferer.

In cancer of the rectum we have to deal with a painful, rapid, unclean, and almost hopeless disease. The only hope of cure, be it ever so faint, is early complete extirpation. A successful operation is dependent on early diagnosis. The faintest suspicion of rectal disease should lead to a thorough examination of the rectum.

TYMPANITIC ABDOMEN WITH FLUID.

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Prof. J. M. Anders,[1] of Philadelphia, has recorded a very instructive case of abdominal distention due primarily to cancer of the liver, in which, much to his own and Professor La Place's surprise, the tympanitic abdomen, which was thought to be caused by intestinal obstruction, proved to contain several gallons of serous liquid. In this case the liver was found to be cancerous.

Since I first read Dr. Anders's account of his case, I have seen two cases in my own practice which are deserving of record. The first was a Chinaman 42 years of age, who died in my wards in the hospital the day after admission. The abdomen was very much distended, and was everywhere tympanitic. On cutting into it, post mortem, several gallons of bloody fluid escaped, the peritoneal cavity being filled underneath the distended intestines. The liver weighed 10½ pounds, and was studded throughout its whole substance with cancerous nodules. Near the cardiac opening of the stomach there was an ulcerated surface with a hard margin. The kidneys were small. All other organs were healthy.

The second case was one I was called to see in consultation, a man aged 37 years. The diagnosis during life was cancer of the stomach. The abdomen was enormously distended, the distention appearing all the greater on account of the extreme general emaciation of the patient. It was tympanitic all over, in every position in which the patient was placed. The heart sounds were conducted, and were very clearly heard, in the right hypochondriac and lumbar regions, a phenomenon I have observed several times in cases of peritonitis. Post mortem there was found cancer of the pylorus. The omentum was a ribbon-shaped mass of cancerous tissue. There were nodules on the parietal peritoneum in the region of the round ligament of the liver. The abdomen was more than half full of jaundiced fluid. There was peritonitis in both iliac regions, with soft adhesions just separable. The gall-bladder was nearly full, but not distended. The liver was dark in color and not healthy.

It is to be noted that in these two cases, as in Dr. Anders's case, the quantity of fluid was very great, the distention on palpation was enormous, and the resonance on percussion was universal. In these circumstances the difficulties attending diagnosis are sufficiently

[1] International Clinics, second series, vol. iii, p. 88.

great to make one cautious in such cases in diagnosing definitely the absence of ascites; and instances of this sort make one even readier than ever to admit that the abdomen, as regards diagnosis and exploratory operation, is "very much a lucky-bag."

BOOK REVIEWS.

PRINCIPLES AND PRACTICE OF MEDICINE. By William Osler, M.D. Fourth Edition. New York: D. Appleton & Co. 1901.

It seems like supererogation to review Osler's work, as it has so long been the standard in this country and has been adopted in England. The *Lancet* says it is the best work on practice in the English language. The attention of our readers should be called to the fact that a new edition has been issued, and that some important changes and additions have been made. The article on typhoid fever has been rewritten. The subject of malaria has been recast, and it is stated that the progress of our knowledge of dysentery, yellow fever, and plague has been so rapid that it has been difficult to get the article upon these subjects up to date. The experience of the clinic at the Johns Hopkins Hospital for the past twelve years, on diabetes and gout, has been analyzed by Dr. Futcher and incorporated in the volume.

We shall briefly mention a few of the opinions of the author upon some of the more recent contributions to medical science. In speaking of cyto-diagnosis in the differentiation of tubercular from other forms of cerebrospinal meningitis, he is unable to confirm the claims made by recent French writers. Of bleeding in pneumonia, he says that it is employed much more frequently than it was a few years ago, and late rather than early in the disease. To bleed at the very onset in robust, healthy individuals, in whom the disease is of a sthenic type, is a good practice. The chief weakness in the directions for the treatment of pneumonia is in combating the toxemia. Saline infusions aid in the elimination of the poison. Support of the heart is still said to be one of the cardinal indications in the treatment of the affection. In this latter opinion, while the author may reflect the views of the majority of the profession, there is still a respectable minority who believe that the treatment of the heart in pneumonia is of comparatively little importance. In the treatment of cholera, saline transfusion or hypodermoclysis is strongly recommended.

The specific germ of yellow fever is disposed of by the statement that the views which the author has been able to gather from those who are best able to judge are to the effect that the specific organism of yellow fever has not yet been discovered. The mosquito transmission of the disease is recognized, and from this it is argued that it is probable that a protozoön is the active infesiens. Experiments upon fomites go far to discredit the belief that it is conveyed by infected clothing. In discussing arthritis deformans, it is said that the theory of infection is gaining ground, though it still lacks demonstration.

In discussing the treatment of appendicitis the writer says that he is impressed with the fact that temporizing in certain cases may result fatally. The general practitioner should remember, whether his leanings are conservative or radical, that the surgeon is often called too late, never too early. Rest in bed and light diet are stated as measures upon which all are agreed. The only two points that there can possibly be any difference of opinion on are as to opium and saline purges. A considerable proportion of the profession in the

West will scarcely agree with this dictum, especially after the brilliant results which have been achieved by the starvation treatment. The light diet is to be condemned.

There are a few omissions, notably a failure of reference to the granulation of the erythrocytes in lead poisoning, and some typographical errors, but they do not seriously mar the work, which is well issued by the publishers.

THE PATHOLOGY AND TREATMENT OF SEXUAL IMPOTENCE. By Victor G. Vecki, M.D. Third Edition, Revised and Enlarged. Price, $2.00. Philadelphia and London: W. B. Saunders & Co. 1901.

The first edition of Vecki's excellent work was favorably reviewed in these pages. The author has decided views in most of the mixed topics in this domain, and some of his facts have unsettled views which have been long accepted. A book with strongly marked characteristics cannot escape criticism, and much has been written on some of the distinctive views of the author.

A tentative definition of impotence is offered, but it is recognized that the term is relative, and that there are all degrees, extending from slight lessening of sexual desire to total incapacity. In discussing the physiology of the sexual act one of the most striking assertions, and one which is contrary to generally accepted views, is that frequent coition in vigorous subjects increases the number of spermatozoa. The writer supports this view with positive observations. A possible explanation is found in the fact that the sperm of the vesiculæ seminales is relatively poor in spermatozoides and is evacuated first; the repetition of the sexual act then empties the vasa deferentia and lastly the testicles. These observations are of importance in considering the question of sterility.

The discussion of the forms of sterility and their treatment is philosophical and accurate. The writer's views on excessive venery are certainly characteristic and contrary to the generally received doctrine, but they are philosophical. He remarks on the distinction between the use and the abuse of the sexual function, that a want of exercise never strengthened a gland or a muscle, and one has only to distinguish between that overuse which leads to exhaustion and irritation and that want of exercise which conduces to imperfect development. Each individual must be a law unto himself.

The work forms one of the most interesting contributions to the subject of impotence that has yet appeared. In the main it is well written, but there is a recurring foreign idiom that is unpleasing, and a use of Latin where there are excellent English equivalents.

UBER DIE ATIOLOGIE DES CARCINOMS MIT BESONDERER BERÜCKSICHTIGUNG DER CARCINOME DES SCROTUMS, DER GALLENBLASE UND DES MAGENS. (The Cause of Carcinoma, Especially as Related to Carcinoma of the Scrotum and the Stomach.) By Dr. Gustav Fütterer. Wiesbaden: J. F. Bergmann, Publisher. 1901.

This monograph of 124 pages is of especial interest at this time, as the etiology of cancer is occupying the professional mind almost to the exclusion of other pathological subjects. The monograph was prepared as a tribute to Prof. Dr. Rudolf Virchow, in honor of his eightieth birthday. To those familiar with the author's painstaking and careful work in other departments of path-

ology, this work will be especially welcome, as it contains the same careful analysis and judicial tone that characterizes all Professor Fütterer's work.

He does not definitely reject the parasitic theory, but thinks that the evidence so far is against it. In metastasis of cancer the same character of cell is conveyed as is found in the original tumor, and it is only by a direct transplantation of tumor cells that a metastatic tumor is reproduced. The mechanical theory is also insufficient to explain all the phenomena of cancer; in it we must assume an alteration in cells, probably brought about by a disturbance in circulation. There is a wide difference in the character of the cancer developed in different tissues, the rapidity of its growth, and the character of the cachexia, the latter not having been sufficiently studied. Thus in a case of carcinoma involving the thyroid gland and necessitating its extirpation, the patient developed myxedema. Upon the development of metastases after the operation, the myxedema disappeared, showing that the cells of the metastasis reproduced the thyroid secretion. It is along these lines that the writer has studied several cases, which, with his painstaking and careful analysis of the findings, makes the work a distinct addition to the literature.

The work is handsomely illustrated, having thirty-eight plates, three of which are colored.

A Laboratory Handbook of Urine Analysis and Physiological Chemistry. By Charles G. L. Wolf, B.A., M.D. Price, $1.25. Philadelphia and London: W. B. Saunders & Co. 1901.

This laboratory guide, prepared by the instructor in physiological chemistry of Cornell University, is a compact little work of 200 pages intended to supply students and practitioners of medicine with an outline of the usual tests, together with a brief statement of their underlying principles. The first portion of the book is devoted to the simple exercises of physiological chemistry, the tests for starch, the recognition of the different albumins, and the spectroscopic examination of the blood. The remainder of the work is devoted to an examination of the secretions of the stomach and of the urine. The simplest tests are given, so that the work has a value for the clinician, though primarily intended for the undergraduate. Only those methods are mentioned which have been tried in the laboratory and found satisfactory.

The Diseases of the Respiratory Organs, Acute and Chronic. By William F. Waugh, M.D. Chicago: G. B. Engelhard & Co. 1901.

This work will prove deservedly popular with the general practitioner. It is chiefly characterized by its abounding faith in remedial measures. The writer has no sympathy with an expectant treatment, which regards with complacency the natural progress of disease. The remedies and measures advised by the author are clearly stated, together with the indications for their employment. The work contains but 221 pages, and hence necessarily deals with the subject-matter in the briefest possible space. There are a few typographical errors, and the absence of an index is to be deplored, as any work, no matter how small, should have its contents made available in this way. The book is especially valuable from the wealth of practical therapeutic indications.

LEADING ARTICLES.

FORENSIC ASPECTS OF PSEUDOHERMAPHRODISM.

The recent application of a male pseudohermaphrodite educated as a female to a Syracuse (N. Y.) court to have the legal status fixed as that of a male is far from unique. Pseudohermaphrodism is sex arrested at the period of sex indifference. The amount of assimilable nutriment of the fetus being fixed, the portion needed for the sexual organs necessarily varies with the condition of the maternal organism. Since development of male organs from the indifferent type does not require so much nutriment as does female development, imperfect maternal nutrition tends (Geddes-Thomson: Evolution of Sex) to result in male sex organ tendencies. If maternal nutrition be affected when sex organs have undergone partial female differentiation, pseudohermaphrodism results. True or bilateral hermaphrodism can only be produced by conditions which cause double monsters. In this case the lessened amount of nutrition is divided between two sets of organs. One set of sex organs is arrested at that point in embryogeny when the male type is becoming dominant.

Under the Roman law the legal status of hermaphrodites was fixed by making them possible witnesses to wills. The legal presumption was that the hermaphrodite was a male. While sex could be questioned, this presumption obtained until female organ predominance was demonstrated. In settling sex legally, the rule of predominance of sex characters obtains nearly as strongly as it did under the Roman law. The English common law with its scientific rules of evidence affords an easy logical method of settling sex predominance in each individual case.

In the United States the subject has most forensic importance in connection with suffrage and marriage. Here the existence of menstruation as an evidence of female predominance has been most strongly contested. This was the chief issue in the suffrage cases reported by Dr. Harris of Virginia, and Dr. Barry of Connecticut (*American Journal of the Medical Sciences*, July, 1847). Menstruation *per se* is, however, not demonstrative evidence of femininity. It has occurred in the male, as witness the cases reported by Pinel, Fournier, Forel, King, Rayman, and others (Gould's Anomalies, p. 28). Fournier's case was that of a 30-year-old man who had men-

struated urethrally since his first coitus, which occurred at puberty. He experienced pains of premenstrual type twenty-four hours before the flow. These subsided when menstruation began. The flow was abundant on the first day, diminished on the second, and ceased on the third. The case of Dr. Barry was decided in favor of masculinity despite some evidences of menstruation.

Hermaphroditic states are also forensically involved in marriage, divorce, sterility, and impotence. Education may give sex direction rather than any innate tendency. Windle (*British Medical Journal*, June 14, 1886) reports the case of a male who had undergone arrest of development in his evolution toward the female type, was brought up as a girl, had unusually pleasing womanly qualities, and as a result was married thrice to intensely devoted husbands; but the real sex was never suspected until the necropsy demonstrated that the supposed woman was a male. In an Italian case (*Gazzetta degli Ospedali Milano*, July 29, 1895) the question of inheritance as a male was not settled until the subject had lived a female fifty-one years. "She" married at twenty-one, but found coitus repugnant and painful. Ten years after "she" separated from "her" husband. Dressing as a woman "she" copulated with women. "She" had an altercation at the age of 51 with "her" brother. "She" prosecuted him for assault, and he in turn charged "her" with seducing his wife. As a result "she" was judicially decided a male.

A man who passed for many years as a female had a cleft scrotum and hypospadias. Sleeping with a servant-girl for three years he had frequent coitus, and finally impregnated her. In another case (Gould's Anomalies) pregnancy and delivery occurred in a girl impregnated by a bed-fellow who proved to be a male pseudohermaphrodite. Such relationships, however, do not demonstrate sex, since sexual inversion, as Kiernan shows (*Alienist and Neurologist*, 1891), may result in pseudohermaphrodism from experiments by females with the enlarged clitoris of the pseudohermaphroditic female, or by males with the pseudohermaphroditic male. In some instances the urethra, as in the female shrew, perforates the clitoris. In other cases the penis is imperforate. In a case reported by Dr. McBurney, a plastic operation enabled a victim of imperforate penis to urinate when erect. The sexual inclinations here varied with dress; male dress inclined it to the female, and female to the male. Its "sister" had an allied deformity. While rare, a tendency to hermaphrodism does occur in families. Phillips (*Virchow's Archives*, lxxv) reports four cases of pseudohermaphrodism in one family.

Pozzi (*Gaz. Méd. de Paris*, 1885) reports a family of nine in whose descendants this anomaly was found. The condition hence may be an expression of degeneracy.

Dr. S. D. Gross once performed castration to deprive a child of sexual appetite and marital tendencies. The child at the time was three years old. It had been considered a girl until two years old, when it began to evince male tastes, dispositions, and feelings. Instead of the penis there was a small clitoris, and instead of the vagina a superficial depression covered with mucous membrane. The urethra occupied the female situation. The nymphæ were diminutive. The labia were well developed, and each contained a normal testicle. Three years after castration the disposition and habits of the child underwent radical change. She delighted in female occupations. Gross advocates the operation; still there are serious doubts as to its justifiability. Castration, as Wharton and Stillé remark (Medical Jurisprudence, vol. iii, p. 150), removed "merely the external and, in cases like this, the very distinct evidence of sex, and hence only adds to the doubts of the rightful sexual character. It does not necessarily extinguish the sexual instinct, nor deprive the person of 'his only incentive to matrimony,' and finally, it in no way relieves him from the odium or aversion with which the malevolent or ignorant may regard him." The surgeon, however, would not be guilty of malpractice provided consent, in the legal sense of the term, was obtained for castration of such patients.

The term hermaphrodite applied to a normal person in contempt has been held not to be libelous, yet, as Wharton and Stillé admit, it tends to create odium. In Scotland this odium has led to the judicial burning of a pseudohermaphrodite for impregnating a girl.

EDITORIAL COMMENT.

ON THE WHITENING OF THE HAIR AND BEARD.

Among his interesting observations upon the mechanism of senility, the Russian savant, Metchnikoff, has made a number of interesting and important observations concerning the whitening of the hair and beard, by which we can explain the phenomena of "turning gray." It is well known that grayness is one of the first signs of approaching age, and that only under distinctly abnormal conditions, such as profound emotion, rare forms of intoxication and unusual varieties of infection, does it occur in the young. It usually makes its appearance gradually, the hairs of the beard and of the head becoming paler, finally turning white one by one. But a day or two may suffice in some cases for the transformation from the normal to the colorless condition. In a number of well authenticated cases the hair over the entire head has been known to whiten in a few hours or days; a considerable number of cases of this kind are to be found in the works of Charcot, de Leloir, and Vidal.

Metchnikoff found the hairs of the lower animals similar to those of man in the transformation brought about by senility. It is a matter of every-day observation that old horses, dogs, and monkeys turn gray. Metchnikoff found that when hairs were boiled in 10-per-cent solution of carbonate of soda, the pigment which ordinarily appears as a uniform mass in the medullary canal is shown to exist in the form of fine granules, contained in the interior of cells in the peripheral part of the medulla. The cuticle is entirely without pigment, composed of thin, horny, fusiform cells.

By studying the development of the hair in young dogs, it was shown that the pigment granules form in the interior of cells of epidermic origin. While these pigment granules are contained in the cells in the medulla of the hair, they are absent from the cells of the papilla of the hair bulb, which leads Metchnikoff to believe that the pigment granules are transported from the cells in which they form to the medulla of the hair. By careful selection it was possible to secure a series of hairs showing all stages between those normally pigmented and those entirely white. In the cells of hairs which were partly whitened, the papilla was found to contain considerable pigment, evidently recently transported to it from the hair,

and it was always found that pigmentation of the papilla was associated with the disappearance of the pigment from the hair. In the hairs from which the pigment was being removed, a number of irregular ameboid cells were usually present, often so filled with pigment that the nuclei could not be seen. The irregular shape of these cells, their many pseudopods, and evident ameboid movement, made it scarcely to be doubted that they were derived from connective tissue, and were engaged in taking up pigment granules from the cells of the hair and transferring them to the papilla and adjacent tissue. These cells Metchnikoff calls "pigmentophages," and the regularity with which he was able to demonstrate their presence in hairs from which the pigment was disappearing leaves him no doubt that the removal of the pigment from the hair depends upon such phagocytic cells. The conditions stimulating these cells to this extraordinary action remain to be discovered. We are, however, familiar with the fact that nervous shock, profound emotion, intoxication, and certain infections may have something to do with it.

Metchnikoff has not yet succeeded in discovering any means by which the activity of these pigmentophages can be prevented, but having opened the way he leaves this practical problem to be solved by others.

A NEW FORM OF PARASITE IN THE MOSQUITO.

The discovery that mosquitoes become infected by animal parasites, for which they serve as intermediate and definitive hosts, has been followed by a considerable amount of experimental study of mosquitoes, and some recent work done in Italy at the suggestion of Celli by Martirano has shown that in a large number of mosquitoes examined during the period of hibernation, a parasite not previously known to occur in these insects was present.

The parasite is a small distoma which is encapsulated during the embryo stage of its development in the tissues of the mosquito, sometimes in the thorax, sometimes in the abdominal cavity. A few times it was found in the salivary gland and the Malpighian bodies. In the months of May and June Martirano found 50 per cent of the mosquitoes examined contained this parasite. He describes the parasite as follows: "The cyst is transparent, elastic, and tough. The embryo distoma almost entirely fills its space and is very actively motile, endeavoring to escape from the capsule by perforating with its anterior end. If one presses upon the cyst it may collapse and the embryo escape with active movements. Each

cyst contains a single worm, which has a leaf-shaped body and elongate form. During its motility it is narrow and band-shaped. It has a thick, smooth integument, two small sucking disks, one in the middle of the body on the belly surface. Through one of these sucking disks the muscular tissue of the esophagus can be seen. The alimentary canal is divided into two diverticula with blind ends. On the sides of the posterior segment two large saccular bodies of grape-like form can be observed. They unite to form a single body directed posteriorly. Many of the worms contained within the cysts and also free within the insect body appear to be without sexual glands. It seems to be certain that this distoma passes a part of its life cycle within the body of the Anopheles." Concerning the entrance of the worm into the mosquito, Martirano gives the following hypothesis: First, that the Anopheles in its larva or nymph stage becomes infected with the distoma through cercaria, which it eats. He found, in fact, in one preparation a cyst with a small appendix which he regarded as a remnant of the tail of the cercarium. Secondly, that the distoma enters the body of the other host when, for example, water in which the Anopheles had died was drunk, or when the mosquito is a prey to the other host; but inasmuch as the other host of these parasites is not known, experimental demonstration of its life history becomes very difficult.

ABSTRACTS.

MEDICINE.

Myasthenia Gravis.—SNEVE, HALDOR. *St. Paul Medical Journal*, vol. iv, No. 1, p. 1, January, 1902.

The subject of this paper is the history of a case of a man 25 years of age, a farmer, who consulted the writer in March, 1901, because of a muscular weakness. There was no history of nervous or mental diseases in the family, and nothing of great importance is noted in the previous history of the patient, who does not use

FIG. 1.—The limit of extension of the arms.

tobacco or alcohol. His general health prior to February, 1899, was good. At that time he noted a weakness of his hands, with a stiff, numb feeling, and weakness of the arms and slightly impaired power in the lower limbs. There was a stiffness and dropping of the lower lip, and some days he had difficulty in swallowing, and at times there was diplopia. Weakness later developed in the lower extremities. During 1899 and 1900 he was treated with electricity and various tonics, under which regimen he improved, so that he was enabled to return to heavy work. After a time muscular weakness returned, food collected between his teeth, and even talking caused exhaustion. The only sensory disturbances complained of was a feeling of weakness and stiffness in the back and legs. In the morning the pillow would be found wet with saliva. The tongue

FIG. 2.—Posterior view of patient in same position.

FIG. 3.—Patient turning on face in effort to rise from floor.

FIG. 4.—Second attitude.

felt thick and was moved with difficulty. At the time he was seen he could walk about one block without resting. To ascend a flight of stairs was practically impossible.

The physical examination showed a patient of medium height, well developed. Fig. 1 shows him standing, and unable to raise his arms beyond the position shown in the picture. Fig. 2 shows the

FIG. 5.—Patient on all fours, showing extreme weakness of back and leg muscles.

FIG. 6.—Patient pushing up the shoulders by grasping the thigh.

back of the same patient. There was a marked dropping of the lower lip and a mask-like face. Both upper eyelids drooped slightly. All the movements were slow and deliberate. Speech was slow and at times indistinct. The pupils were normal and reacted to both light and accommodation. The movements of the eyeballs were

normal. The ocular fundus was normal. Hearing, taste, and smell, as well as sensation over the entire body, were intact. The reflexes at the knees, wrists, and elbows were normal, as were the abdominal and cremasteric reflexes.

At the first examination it was thought that the case was one of ordinary neurasthenia, but the persistence and gravity of the symptoms soon convinced the writer that there was trouble of a more serious sort. The patient could not cross one leg over the other without lifting the leg with his hands, and he was afraid to ride on the street-cars or to walk about, as he feared that he would be unable to get into the car. When lying upon his back and attempting to rise, he assumed the positions shown in Figs. 3, 4, 5, and 6. He would first turn on the left side, usually making one or more efforts; then the elbow would be placed upon the floor and the upper part of the body lifted by the arms. This was continued until he would get upon his feet and hands. Then with one hand on his knee and the other grasping a door-knob or chair, he would finally rise to an upright position. He could whistle five seconds, when his lips would relax. He could flex and extend the arms at the elbow fifteen times in succession. Later examinations showed marked variability in the power of the muscles. At times flexion and extension of the forearms could be performed up to thirty-four times. On some days there was a complete myasthenic reaction with the faradic current.

At no time during the illness of the patient was there any involvement of the involuntary muscular system; the bladder and rectum were always normal. The recovery in the spring of 1900 which followed the use of static electricity led to its employment later, and combined with it strychnine, iodide of iron, suprarenal capsules, thyroids, and hypophosphates, but with no improvement in the symptoms.

The Symptoms and Treatment of Movable Kidney.—MORRIS, HENRY. *Lancet*, vol. clxi, No. 22, p. 1467, Nov. 30, 1901.

A certain degree of mobility is natural to the kidney. Deep inspiration and forced expiration increase these movements. The slight, natural descent of the kidney in respiration cannot be detected by palpation in every individual. Every kidney that descends during inspiration so that it can be felt is not to be regarded as having relaxed supports. When a kidney descends during deep inspiration below the examiner's fingers, so that its whole surface can be felt, then the supports of the kidney may be considered as unduly relaxed.

There is a marked discrepancy as to the frequency of movable kidney, the figures ranging all the way from 1 to 22 per cent of all patients examined. Glenard placed the total number of movable kidneys at 14 per cent in females alone, the figures reaching 22 per cent. Senator and Guttmann placed the figures as low as from 1 to 3 per cent. Some of the statistical tables of post-mortem examinations show a proportion as low as one case in one thousand. This latter figure is thought to be due to carelessness in examinations, thus overlooking all but those cases in which the kidney defect was very marked. Movable kidney is easily overlooked in the living, as the method of bimanual palpation commonly employed may serve to retain the kidney in the renal fossa. In examining for movable kidney, the patient should be upon the back, upon a mattress or sofa, with the legs slightly flexed. In examining the right kidney, the patient should be brought to the edge of the right side of the couch, and to the left side of the couch in examining the left kidney. The fingers of one hand are then placed below the last two ribs, and the other hand flat upon the abdomen, just below the costal margin, near the outer border of the rectus muscle. The hand on the front of the abdomen then steadily depresses the abdominal wall backward and outward. The kidney, if enlarged or displaced, will be felt between the two hands, and if not enlarged the lower pole of the organ will in some persons be detected by the fingers during natural inspiration. Should this not be the case, the patient is directed to take a long and deep inspiration, and then suddenly, without muscular effort, allow the air to escape from the lungs. The physical signs of movable kidney may be difficult to elicit, because of obesity. There may be a wide range of movement, and yet the kidney be quite beyond the reach of palpation, and some of these cases present acute subjective symptoms. Too much importance should not be attached to the result of a *single* examination.

A floating kidney may sometimes be reduced, and nothing that the patient can do will cause it to float again, though the following day it may be as free as ever. The pain of movable kidney is sometimes spoken of as backache, and occasionally the pain extends down the affected side of the abdomen, or there is a dragging sensation in the loins. Sometimes the pain is below the shoulders and at the back. Occasionally there is an uncomfortable sense of something moving in the side; it may disappear on lying down, and become aggravated by walking and standing. In some cases the recumbent posture does not give relief for

hours. Neuralgic pains in the course of the nerve trunks on the affected side may complicate the diagnosis. Renal paroxysms of grave severity are in some cases excited, which are probably due to displacement and rotation of the kidney, with torsion of its pedicle. Disturbances of the digestive system are in some cases especially prominent; the vomiting is often severe, sometimes preceded by pain in the epigastrium. Obstinate constipation is a not infrequent symptom, and it is sometimes associated with an irregularly recurring diarrhea. Movable kidney, because of the pain, may lead to the development of hysteria or neurasthenia. In some cases a neurotic condition may have its cause overlooked, because of a failure to examine for movable kidney, but it is not uncommon to have the hysterical element underestimated, and too much importance attached to the nephroptosis. As a rule, the urine is healthy in the uncomplicated cases. Enteroptosis may be associated with movable kidney, but there is no necessary relation. Sometimes the kidney is displaced without any other organ sharing in the difficulty.

When movable kidney is associated with enteroptosis, no operation should be performed on the kidney, unless it is evident that the more serious symptoms are due to the kidney, and not until after trial of an abdominal support. When a movable kidney is complicated by a movable liver, or when both kidneys move, the same rule should be followed as in general enteroptosis. When both kidneys cause symptoms they should be fixed one after the other, by an operation, a week being allowed to intervene between the two operations. When the movable kidney occurs in a hysterical or neurasthenic patient, palliative means should be tried before resorting to an operation. For uncomplicated or movable kidney, in which the principal symptoms are pain and gastrointestinal troubles, the operation may be confidently offered and carried out without any previous trial of belts or a rest. When renal crises are a feature of the case, nephropexy ought to be strongly urged, because of the importance of keeping the kidney in its proper place.

A Family Form of Recurring Epistaxis with Multiple Telangiectases.—Osler, William. *Bulletin of the Johns Hopkins Hospital*, vol. xii, p. 333, November, 1901.

The association of recurring epistaxis with multiple dilatation of the blood-vessels of the skin and mucous membrane is infrequently referred to in the literature, but one instance having been found.

Two of the three cases reported belonged to a family in which epistaxis occurred in seven members. Both of the patients had

bleeding at the nose from childhood, and both presented punctiform angiomata of the face—nose, lips, cheeks, and tongue.

A third case was that of a man 49 years of age, who had complained of epistaxis which recurred at short intervals from boyhood. The bleeding began when he was ten years of age, and it greatly interfered with his business activity in adult life. When a lad he noticed reddish spots on his face and hands, which have persisted and increased in number during the past seven or eight years. Upon admission, the red corpuscles were 3,460,000 and the hemoglobin 38 per cent. There was marked poikilocytosis. The angiomata were most numerous on the face, which was much disfigured by them. On the right cheek there were twenty-five, some of which projected slightly beyond the skin as purplish spots. The left cheek contained about twenty, and numerous red spots were scattered over the back, abdomen, and chest. On both sides of the nasal septum were numerous scattered angiomata, similar in appearance to those on the cheeks. An extensive nasal cauterization lessened the number and severity of the hemorrhages. Later, the bleedings returned with some severity, and the patient devised an apparatus for checking the hemorrhages, using for this purpose a small finger-cot mounted upon a piece of rubber tubing. As soon as the hemorrhage occurred, this was introduced into the nostril, and the patient inflated it by blowing into the tube, the air being retained by a stop-cock. With this apparatus he has been able to restrain the hemorrhage.

A Case of Asthenic Bulbar Paralysis.—HUNTER, W. K. *Lancet*, vol. clxi, No. 23, p. 1588, Dec. 7, 1901.

The patient, a man of 58 years, was admitted to the Glasgow Royal Infirmary complaining of difficulty in speaking and swallowing, and of an intermittent weakness in the extensor muscles of the neck. These symptoms had set in some two or three months before admission, and were attributed by the patient to his having carried on his head, on two successive days, a heavy load of books. Since that time his head had tended to drop forward onto the chest. This symptom gradually increased, and sometimes the head could not be kept upright unless held in that position. There was a defect in speech which would come on after he had been talking for some time. The defect in swallowing was intermittent. Three weeks before admission there was a slight weakness in both arms. The family history was negative, and for many years the patient had used no alcoholic liquors. The anemia was marked; there was no

paralysis of the muscles of the face, and the tongue could be protruded without much difficulty. The defect in speech varied greatly from time to time. The same intermittence was noted in his ability to swallow food. The dropping of the head was due to weakness and a certain amount of wasting in the trapezius and erector spinæ muscles. There was no loss of power in the legs; the knee-jerks were unduly active, but there was no knee or ankle clonus. Sensation was normal. The fields of vision were not contracted, and the visual acuity was normal. The pupils were equal, responded readily to light, but were rather sluggish in accommodation. There was a slight paralysis of the right internal rectus. The patient died in a dyspneic attack.

The pons, medulla, and cord were fixed in formal and later transferred to Müller's fluid. Sections stained by Weigert and Nissl were normal. There were no degenerative changes in the motor or sensory tracts, nor in any of the anterior or posterior nerve roots. Special attention was paid to the third and fourth segments of the cord, parts related to the spinal accessory and phrenic nerves. Throughout the whole cord the motor ganglion cells stained well. In counting the cells in the various groups of the anterior horns there was a diminution of about 30 per cent. But this seemed to be about the same for all levels of the cord. Some diminution is common in old people. Many cells contained pigment granules, this condition being most marked in the lumbosacral region, where quite 50 per cent of the ganglion cells were pigmented. The ganglion cells of the fifth, seventh, tenth, and twelfth motor nuclei appeared to be normal; the cells of the seventh were the only ones that contained pigment in considerable amount. The cells of the motor cortex showed no abnormality. The peripheral nerves were not examined, nor were the muscles. Clinically, the case is a typical example of the asthenic bulbar paralysis, or, perhaps more correctly, myasthenia gravis.

Unrecognized Syphilis.—Bulkley, L. D. *International Medical Magazine*, vol. x, No. 12, p. 719, December, 1901.

In concluding an article on the importance of recognizing syphilis in general practice, it is said that the absence of a history of sexual exposure should never throw one off his guard when there is reasonable evidence of the existence of syphilis. In addition to the cases of marital and hereditary syphilis there are the cases of extragenital chancre. The latter are found to include 6 per cent of males, and 12 per cent of syphilitic women. Syphilis is a very erratic dis-

ease; early symptoms are often held in check by treatment, but when the evolution of the disease is not interfered with, the early signs may be slight and escape notice. Many cases of unrecognized syphilis have severe late symptoms, with extensive destruction of tissue and severe lesions of the internal organs. Apparently extragenital infection is of a more severe character than syphilis acquired in the usual way. A careful and prolonged treatment is essential in controlling the disease, and many of the later manifestations of the disorder are due to an imperfect treatment in the early stages.

Myxasthenia.—Overend, Walker. *Lancet*, vol. clxi, No. 22, p. 1486, Nov. 30, 1901.

By this term the writer understands a deficiency in the production of mucus. A number of articles have appeared upon this subject, in which somewhat similar symptoms were grouped under the terms "desiccation," "irritation," and "ulceration" of the mucous membranes. The symptoms described in the case reported are a reddened and fissured tongue, the mucous membrane of the mouth and pharynx presenting whitish streaks, pains at the angle of the ribs, heartburn, dryness of the mouth, and pain after eating. For this condition mucin was prescribed in the form of tablets, combined with menthol and lime water.

SURGERY.

Examination of the Blood in Surgical Cases.—Bloodgood, J. C. *Progressive Medicine*, vol. iv, p. 205, December, 1901.

The Postoperative Changes in the Blood,—Frazier, C. H., and Holloway, T. B. *University of Pennsylvania Medical Bulletin*, vol. xiv, No. 10, p. 363, December, 1901.

John B. Deaver stated at the last meeting of the American Medical Association that "in the last few years there has crept into the profession a tendency to replace the bedside by the laboratory as the point from which to make a diagnosis; to substitute the highly magnified but extremely limited field of the microscope for the broader view of the eye of the physician. This we regret, for in the majority of instances the diagnosis must be made at the bedside without the aid of the microscope, and any man who has no confidence in the diagnosis made without the aid of the laboratory limits his usefulness."

Bloodgood favors a directly opposite view. The great development in recent years in the improvement of bedside diagnosis is due

to the laboratory. The clinician who associates his bedside study with laboratory examination is better able to interpret the early symptoms of disease. The blood examinations of surgical patients are of sufficient importance to require that they be made a routine procedure. The grave anemias in which the hemoglobin falls to 30 or 40 per cent are contraindications to general narcosis. So far as possible, this condition should be remedied by treatment before operation is undertaken, and where such blood changes exist, it is better if possible to use a local anesthetic. In abdominal tumors, especially in the region of the spleen, no operation should be performed without a blood-count.

If surgeons wish to be considered clinicians as well as operators, they must take advantage of the advances which have been made in the careful and systematic examination of the blood.

To interpret correctly the value of the blood-count, especially the leucocyte count, it must be considered as one of the various symptoms, and it is of the utmost importance that it should be judged in relation to the duration of the other symptoms. For example, the leucocyte count is of value in the diagnosis of acute appendicitis, when it is interpreted in reference to the duration and character of the attack. In typhoid perforation, the increase in the number of leucocytes is of very short duration, and unless a blood-count is made before and after the attack it may be entirely overlooked. In cholecystitis a leucocyte count is of no value unless it is stated at what time after the beginning of the symptoms such count was made. Commonly, after obstruction of the intestine, the number of leucocytes begins to rise, a condition which lasts for a few hours, when there is a rapid decline; therefore the blood examination, to be of diagnostic importance, must be made frequently, and must be interpreted by the other symptoms.

Frazier and Holloway give in tables the result of the blood analysis in forty cases, which were operated upon at the University Hospital. A uniform system of blood examination has been adopted for surgical cases. The directions for the hematologist are:

(*a*) Preoperative records.

1. On the admission of the patient to the hospital, the percentage of hemoglobin and the number of erythrocytes and leucocytes is estimated, and of the latter a differential count is made.

2. A count of the leucocytes is made at 9 A.M. on the day of the operation.

(*b*) Postoperative records.

1. In all major operations, including the peritoneal cavity, ampu-

tations of the extremities and breast, and the removal of large tumors, a daily estimation of the white blood cells is made, until they return to normal.

2. In complicated cases the frequency of the counts is determined by the nature and character of the complications.

3. In operations involving the peritoneal cavity and in abdominal injuries where there is reason to suspect perforation of a viscus or serious internal hemorrhage, a leucocyte count is made at least every third day.

4. A differential count is never required except upon the patient's admission to the hospital, unless conditions arise which suggest the importance of such a record.

5. The daily blood-count must be taken at as nearly as possible the same hour, and, so far as possible, digestive leucocytosis must be eliminated.

Frazier, in concluding his analysis of the forty cases of postoperative blood examination, expresses in emphatic terms the practical importance to the surgeon of the knowledge derived from the study of the blood in the postoperative period. By many the results of the blood-count at this period are thought to be unreliable, but this is due to the fact that too much is expected of the blood-count; it is only a link in the chain of clinical evidence.

A Case of Abdominal Actinomycosis. — VANDER VEER, A., and ELTING, ARTHUR W. *Albany Medical Annals*, vol. xxiii, No. 1, p. 1, January, 1902.

Patient a carpenter, a native of the United States, aged 45. He was admitted to the Albany Hospital February 22, 1901. The family and previous history were negative. He had not associated much with animals and never worked in grain. The present illness began November 27, 1900. There was pain in the stomach which was not relieved by rest and treatment. The pain continued for a week and then gradually diminished, but eight weeks elapsed before it entirely disappeared. There was no rigor, fever, or vomiting. The pain did not become localized or radiating; it seemed to the patient to be in the bowels. The abdomen was never distended, and the bowels moved regularly, urination being normal. In January, 1901, improvement began, and in February the patient stated that he was as well as ever. A small tumor was then noticed in the region of the umbilicus. The examination at this time showed another tumor in the right iliac region, and other small masses could be felt in the abdominal wall and within the abdomen. The blood examination

FIG. 1.—Actinomycosis abdominalis. Front view of abdomen.

showed a leucocytosis of 18,500, the red corpuscles numbering 4,710,000. The abdominal incision was made in the middle line, and upon opening the peritoneal cavity numerous adhesions were found between the intestines. A flattened tumor was found springing from the right iliac crest. The case was thought to be a multiple sarcoma of the mesentery. The pus from the abscess in the region of the umbilicus was examined and showed typical actino-

FIG. 2.—Actinomycosis abdominalis. Lateral aspect of the abdomen.

myces. Cultures from several of the abscesses showed such a vigorous growth of the bacillus coli communis that the characteristics of the actinomyces were obscured. Under iodide of potassium in increasing doses, the general condition of the patient improved. During the summer the patient's condition was variable, and it was occasionally necessary to open abscesses. In the latter part of August there was a distinct improvement in the condition of the

FIG. 3.—Actinomycosis abdominalis. Showing the progress of the case.

abdominal wall, the patient had gained in weight, and during the fall a small abscess containing actinomyces was opened at the inner angle of the right eye. In October there was marked improvement in the general health of the patient, but the abdominal walls still presented four or five discharging sinuses. The skin of the abdomen was bluish-red, and in some places pigmented. The induration had decreased to an area about 8 by 10 centimeters to the left of the umbilicus.

FIG. 4.—Actinomycosis abdominalis. Appearance of the abdomen at the termination of treatment.

Division of the Sensory Root of the Fifth Nerve for Neuralgia.—SPILLER, W. G., and FRAZIER, C. H. *University of Pennsylvania Medical Bulletin*, vol. xlv, No. 10, p. 342, December, 1901.

This is a clinical and experimental study upon the effect of division of the sensory root of the fifth nerve. Some years ago Spiller suggested that this might be performed in place of removing the

ganglion, and the question was raised as to whether there would be a regeneration of the sensory root if it were divided. Spiller cannot come to an opinion as to whether the nerve root will regenerate or not, but inclines to the belief that it will.

Surgery of the Gasserian ganglion is discussed by Frazier. In one case in which he divided the sensory root the patient was 68 years of age. The neuralgia began five years before the operation with pains referred to the distribution of the right supraorbital nerve. One year after the beginning of the neuralgia, neurectomy of the supraorbital was made, which was followed by a period of relief. A second, then a third, and finally a fourth peripheral operation was performed, each affording some relief, but the time in which the pain ceased diminished after each operation. On October 12, 1901, there was division of the sensory and motor roots of the Gasserian ganglion. It was the intention of the writer to avoid section of the motor root, but it was accidentally severed. Too little time has elapsed since the operation to offer an opinion as to the permanency of the relief, but the immediate effect was a complete cessation of the pain.

It is claimed that the operation of division of the sensory root is simpler than that for the removal of the ganglion, and it should be attended with a less mortality. The early steps of the operation are exactly the same as in the Hartley-Krause operation, the trephine being applied to the foramen ovale or the foramen rotundum, and a hook being slipped under the sensory root, raising it up and dividing it. In this case the root was divided, but the operator recommends that a small portion be excised. There was no involvement of the cornea, the trophic function of the ganglion not being impaired by this operation. The operation for the division of the posterior root is practically complete when the posterior surface of the ganglion has been exposed, and this avoids the more serious and troublesome complications which are liable to be met in the removal of the ganglion. The cavernous sinus is never endangered, and there is no risk of injury to the sixth nerve.

Resection of Two-thirds of the Liver for Angioma.—Beck, Carl. *Chicago Medical Recorder*, vol. xxi, No. 6, p. 383, December, 1901.

The case reported is that of a man 20 years of age, who at the age of 15 received a severe kick in the abdomen. He was confined to his bed, and for many weeks suffered from pain in the left side. Later, there was a recurring tumor, tenderness in the left upper epigastrium, and cough, with expectoration of thick mucus. Dur-

ing the two months before he came under observation the temperature was slightly above normal, and there was marked failure of the general health.

At the time of operation there was a tumor, pyriform in shape, in the left epigastrium. It was solid and irregular and seemed to be contiguous with the liver. Upon opening the abdomen the tumor presented, having a circumference of about twenty inches. It included the left side of the liver, the right lobe being extremely small. The stomach was behind the tumor, and the spleen was not involved. The gall-bladder was at the border of the tumor. The stomach was with difficulty separated from the liver, and an elastic ligature was placed around the growth. The ligature was prevented from slipping by large pins. A portion of the tumor was then removed, the remainder being allowed to slough. An examination of the growth showed that it was a cavernous angioma containing a few nodules of normal liver tissue.

The after-treatment was difficult, the sloughing portions being gradually removed. The hemorrhage was slight; the retrohepatic cavity was drained. The patient made a slow recovery, the temperature ranging from 102° to 103° after the operation. Later, the temperature went to normal, the appetite improved, and an examination showed that the remaining portion of the liver was enlarging. This is the most extensive resection of the liver that has so far been made.

THERAPEUTICS.

Treatment of Chronic Gastric Catarrh. — EWALD, C. A. *International Medical Magazine*, vol. x, No. 12, p. 713, December, 1901.

In the treatment of gastric catarrh two indications are to be met: (1) Diminution of hydrochloric acid and pepsin; (2) lessened motility of the stomach. As a result of these two factors fermentation occurs, the character of which is determined by the kind of microörganisms.

The disturbance of the secretory function of the gastric mucosa is best met by the administration of as much of the acid as the patient can tolerate, administering it at intervals of ten minutes after meals. In some cases in which the stomach-tube is well borne, we may through the latter introduce directly into the stomach a solution of 0.2 per cent of hydrochloric acid, which corresponds with the normal quantity. Carminatives and bitter tonics directly excite the activity of the secretory cells; among

the best of these is condurango bark. The latter is preferably given in infusion.

Among the remedies which increase the motility of the stomach, strychnine is the best; it should be given in the form of tincture of nux vomica. Massage and electricity, the latter whenever possible by the intragastric method, are useful adjuncts. In treating fermentations, the stomach should always be washed out; by what method is indifferent, so long as the stomach is properly cleansed. A weak antiseptic solution, such as two-per-cent boric or salicylic acid, or one-per-cent lysol, should be employed. Fermentations may be inhibited by the following:

℞ Resorcini resublimati 5.0
Bismuthi salicylat 10.0
Natrii bicarbonat 15.0
Sacchari albi 15.0

M. Sig.: A small teaspoonful each two hours.

Such a powder can be administered without interfering with the hydrochloric acid, pepsin, or bitter tonic.

Without a suitable regulation of the diet no recovery is possible. The regimen should begin with careful attention to the mouth and teeth, and the patient should be enjoined to thoroughly masticate the food. White meats, including poultry, are more digestible than red meats; fat meats in general are to be avoided. Eggs are sometimes well borne; and again they are difficult of digestion. Soups made from the red meats are also to be rejected, as they are so rich in salts as to prove irritating to the mucous membrane. All highly spiced foods should be rejected. Milk is one of the best articles of diet, but unfortunately it is not well tolerated by many stomachs. So far as possible, the starches should be converted into dextrin. Vegetables are generally digestible, particularly if cooked in salted water; there are some, such as cabbage, peas, and beans, which are not well tolerated.

It is important that the patient should as soon as possible return to the ordinary diet, as a too restricted diet may add to the original gastritis a condition of general debility that will be exceedingly difficult to relieve.

Artificial Milks.—Kolipinski, L. *Medical News*, vol. lxxix, No. 25, p. 979, Dec. 21, 1901.

The writer starts with the premise that milk is the ideal food, representing in approximately normal proportions all that is necessary in the nutrition of the body. With some individuals milk disagrees, causing diarrhea, indigestion, and occasionally attacks of

migraine or a series of symptoms which the patient calls biliousness. In compounding an artificial milk, it should represent approximately the constituents of ordinary milk, and should be composed of substances that are inexpensive and readily obtained. Further, it must be palatable and be easily and quickly prepared. These requisites are fulfilled in the following general formula: Extract of malt, one tablespoonful; olive oil, one tablespoonful; roasted flour, two teaspoonfuls; one raw egg. Beat up in a bowl or dish with a spoon or egg-beater for three or four minutes; add slowly, while stirring, a tumbler of cold water; season with table salt.

The extract of malt in the above formula is to emulsify the oil, and for its diastatic effect upon the flour. The olive oil represents the fat of milk, the egg the albuminoids, and the table salt is added to improve the taste of the compound. Roasted flour, which has been converted into dextrin and maltose, represents the milk-sugar. This general formula can be modified in a number of ways to meet the indications in a particular case. The flour may be increased in amount, or diminished, or omitted. The olive oil may be replaced by any other oil or food. Cod-liver oil may be used in place of the olive oil, and in this way it is found that it can be administered during the summer months, without causing gastric disturbance. Butter and chocolate may be added to such a mixture, and if the latter substance is included the roasted flour is left out. The chocolate should be grated, or in fine powder.

A number of clinical histories are given in which dieting was largely aided by the use of these mixtures. One is that of a patient suffering from chronic pulmonary tuberculosis with ulceration of the intestines. He was given milk, which precipitated an attack of migraine. He was then put upon the artificial mixture, and gained seven and a half pounds in a short time.

General Medical Treatment of Syphilis.—Lydston, G. Frank. *Medical News*, vol. lxxx, No. 3, p. 101, Jan. 18, 1902.

Essentially the treatment of syphilis is specific medication, but it cannot be relied upon alone in this disorder, and compared with other therapeutic indications it often sinks into insignificance. Success or failure in the treatment often depends upon the general therapeutic skill rather than the persistence with which specific therapy is followed.

Elimination is of the utmost importance in specific medication. Ptyalism and iodism may be avoided in many cases by attention to this point. To insure sufficient dilution of the iodides, the daily

dose should be mixed with two quarts or a gallon of water, and drunk at intervals during the day. Hot baths are useful adjuvants and enhance the therapeutic action of the mercury and iodide. In preventing the unpleasant consequences of both mercury and the iodides, attention to the bowels is of the utmost importance. In cases in which the bowels are too loose following the administration of mercury, the substitution of the tannate of mercury for other preparations is useful. In some instances the value of specific medication in this disease is inhibited by digestive disturbances, and they may make hypodermic administration imperative. When iodides are given and the stomach and bowels are irritable, considerable trouble is often experienced in carrying out the treatment. When the fault lies with the stomach, the combination of essence of pepsin with the iodides is useful. Taka-diastase is indicated when the irritation is largely of the bowel and starch indigestion exists.

In some syphilitic lesions, particularly of the mucous membranes, in which iodides and mercury are not well borne, relief is obtained by the administration of ten-grain doses of chlorate of potassium. This drug, while not a specific for syphilis, has a positive action upon the syphilitic lesions of the mucous membranes. The use of tonics in the treatment of syphilis is of the utmost importance; the disease is debilitating, and is often accompanied by a profound anemia, to which the specific medication contributes. The combination of iron with specific medication is often indicated. In long-standing cases the syrup of the iodide of iron is the most satisfactory preparation. The wine or fluid extract of coca is of value in avoiding debility in this disease. The administration of arsenic with the mixed treatment tends to prevent debility, and is also useful in overcoming the effects of the iodine upon the skin.

The cardinal principles in the treatment of syphilis are three: First, a specific disease, to be controlled by specific medication; secondly, a distinct personality; thirdly, the results of antispecific medication. Too frequently there is a tendency to treat syphilis and ignore the individual afflicted by it.

Cuprol in Conjunctival Inflammations.—Von Sicherer. *Die Ophthalmologische Klinik*, No. 23, Dec. 5, 1901.

Cuprol, a combination of copper and nucleinic acid, first suggested by Dr. Schwickerath, of Bonn, has been used by the writer in the treatment of conjunctival inflammations for the past ten months. This salt of copper contains 6 per cent of the metal, and is readily soluble in hot water, and to a considerable extent

in cold water. With albuminous liquids there is no precipitate. It is not thrown out of solution by alkalies. The best preparation for practical use is a 10-per-cent solution made with one-half-per-cent chloretone as a preservative.

A distinct advantage in using this organic combination of copper is that a 10-per-cent solution produces either no or slight pain, and very little irritation of the tissues. Comparing it with the best organic copper preparation hitherto available, cuprargol, it is much less irritating. When a 10-per-cent solution of cuprol is dropped into the conjunctival sac, in from ten to twenty minutes there is a slight burning sensation of short duration, but this is only observed in a few patients. The writer has used the copper solution particularly in acute and chronic catarrh of the conjunctiva. In most of the cases prompt relief from the trouble was noted. It has proven successful in chronic catarrh of the conjunctiva after other therapeutic measures had failed. In obstinate cases the substance may be applied directly in the form of a powder. The pain attending this procedure is slight, and it is never necessary to use a local anesthetic.

The writer has had no personal experience in the treatment of trachoma, but S. Snell (*Sheffield Lancet*, Sept. 14, 1901) has found that cuprol has greater penetrating power and irritates less than the ordinary copper salt. He has used the preparation in acute and chronic cases of trachoma, applying the powdered drug with a brush to the everted lids. He found that the customary anesthesia with cocaine was not necessary when this salt was used, the pain in most cases being so slight that the patients could leave the clinic at once, after the drug was used. In the intervals between the application of the powdered drug, the patients were given a 5-per-cent cuprol solution which was dropped into the eye.

Cuprol seems to possess two obvious advantages over the inorganic salts of copper, namely, absence of pain and of irritation, two qualities that render it superior to other astringents in the treatment of inflamed conjunctiva.

X-Rays in the Treatment of Cutaneous Epitheliomata. — ALLEN, C. W. *Medical Record*, vol. lxi, No. 4, p. 125, Jan. 25, 1902.

The writer has so far been unwilling to confine his treatment to the *x*-rays alone, believing that they have not yet reached beyond the expermimental stage. Certain caustics, if properly applied, quickly and effectively destroy many cancerous growths. It is wise

to combine both methods, using either the knife or the cautery, and following it by the *x*-rays to destroy such cancerous structures as may lie beyond the field of operation. In this way the rays act as an after-cure. In all he has treated six cases of epithelioma; four were recurrent cases, and one was primary. One disappeared from observation, and the others have done well.

As we have no means of measuring the intensity of the rays or the susceptibility of the individual, caution should be exercised in giving the first treatment to a patient. It is well after the first sitting to wait a week before proceeding with the daily applications, for which the time of exposure may be gradually lengthened. If dermatitis or erythema appears, the treatment should be suspended. Most of the writer's work has been done with the tube at a distance of from three to five inches from the affected area. The time of exposure varies between three and thirty minutes, the average being from fifteen to twenty minutes. A tube best adapted for skin diseases and cancer should have a low vacuum. The dangers are not thought to be great if care is exercised in shortening the sittings and properly protecting the surrounding parts. Methylene blue has been used in connection with the rays, with some benefit. The blue solution tends to lessen the ultra-violet or chemical rays which have the burning quality.

Fanghi di Sclafani in Acne Rosacea.—Von Fleischl, Otto. *Wiener Klinische Wochenschrift*, 14th year, No. 49, Dec. 5, 1901, p. 1204.

This substance is a volcanic earth which is found in Sclafani, Sicily. It has been used by Levier in Florence for more than twenty-five years, with the utmost satisfaction. It is a grayish-yellow, fine powder. Under the microscope prismatic crystals are seen. The taste is sour, the reaction acid. It consists, for the most part, of sulphur in exceedingly minute division. A small quantity of the powder is mixed with a teaspoonful of water in a porcelain dish; the resulting milky fluid is applied with the end of the finger to the reddened skin. This is done at night, and the following morning the skin is found to be covered with powder. It is then washed off. The following evening the procedure is repeated. In some cases the remedy is irritating, and in such the treatment must be interrupted for one or more days. It is wise to begin with small quantities, to determine the reaction produced in the skin.

It is only the less severe forms of acne that are benefited by the remedy. In those cases in which papules form, scarification or division is absolutely necessary.

The Blood-pressure Raising Power of the Suprarenal Gland. — TAKAMINE, JOKICHI. *Journal of the American Medical Association*, vol. xxxviii, No. 3, p. 153, Jan. 18, 1902.

The writer refers to some of the earlier investigators upon the suprarenal gland and to the methods which have been followed in separating its active principle. He describes the method which is employed in separating and purifying adrenalin, a substance of remarkable physiological activity. A fraction of one drop of aqueous solution of adrenalin or its salt, in a strength of 1 to 50,000, blanches the normal conjunctiva in one minute. It is the strongest hemostatic known. The intravenous injection of adrenalin powerfully affects the muscular system, but especially the muscular walls of the small blood-vessels and the heart muscle, with consequent rise of blood-pressure. It is a strong heart stimulant, and may be used in opium poisoning and wherever there is circulatory failure. It is especially useful in the prevention of collapse during anesthesia.

A convenient form of administering adrenalin is in solution, using the chloride 1 part to 1000. To insure stability of the solution, one-half per cent of chloretone may be added. Adrenalin can be used in the form of tablets, using the tartrate.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Irrigation of the Bowel in Epidemic Diarrhea of Infants.—BENNETT, W. B. *Lancet*, vol. clxi, No. 25 of vol. ii, p. 1728, Dec. 21, 1901.

Epidemic diarrhea among infants has been frequent and fatal in the city of Liverpool. An epidemic occurred in that city which began in June, 1900, and continued until the following October; 900 deaths were registered as due to this disease during this period. It was found that the remedies recommended for this condition were mostly useless. The usual dietetic methods, such as cutting off the milk where the latter had been given as food, was, in the simple cases, followed by some relief, but in the more severe ones the disease continued with great severity.

The writer describes the case of an infant of seven months, who was taken ill with vomiting and diarrhea the day before coming under observation. The mother had administered a dose of castor oil, but it was not followed by relief of the intestinal symptoms. All food was stopped; the child was put upon barley water, which relieved the vomiting. On the second day an additional dose of

castor oil was given, with a solution of corrosive sublimate. The stools were slimy and offensive. The number of movements varied in twenty-four hours from eight to twelve. On the sixth day of the disease, when the number of motions had increased and the pain had become very severe, convulsions occurred, which were controlled by the bromide of potassium. On the eighth day the child was in a serious condition: the tongue was dry, the abdomen tender, and the bowel movements occurred about once each hour. On the ninth day a weak solution of permanganate of potassium was injected into the bowel. The solution was hot, and only a small quantity was used. As soon as the syringe was withdrawn the fluid was violently expelled. It was followed by an additional injection of eight ounces. There was an immediate improvement in the diarrhea and the child was more comfortable. On the same afternoon there was a natural bowel movement. The writer is convinced that this is the correct method of treating infantile diarrhea, and it should be instituted in those cases in which a regulation of the diet and the administration of a simple antiseptic by the mouth is not followed by relief.

Diagnosis of Tuberculosis in Infants.—CRANDALL, FLOYD N. *Archives of Pediatrics*, 19th year, No. 1, p. 32, January, 1902.

Tuberculosis in children may be divided into two general types —those cases resembling infantile marasmus, and those accompanied by continued fever. Comby, following the tendency of the French school to minute subdivision, divides tuberculosis in infants into five clinical types, referring especially to an "apyretic" tuberculosis with symptoms of an ordinary dyspepsia. Infancy and childhood are the periods of life in which tuberculosis tends strongly to hide itself in deep and inaccessible tissue. The deeper-seated lymphatic glands may be involved, producing the constitutional symptoms, but without evidences of local involvement by which the disease can be identified. Many practitioners associate tuberculosis in their minds with cough and fever. In infancy cough is often lacking, even after pulmonary invasion.

A distinctive type of the tuberculosis of infancy resembles a typhoid or continued fever. This form may be preceded by a preliminary stage of malnutrition. These cases present a difficult diagnostic problem. In summing up an outline of tuberculosis in children, the writer says that anemia and wasting are constant accompaniments of this condition. Such symptoms may occur long before local signs appear. There is a special tendency for tubercu-

losis to develop in the deeper tissues, where it cannot be identified. In some cases the anemia and wasting are followed by an irregular fever, after which local lesions may appear, usually in the lungs. In some cases tuberculosis begins with well marked local manifestations, particularly pneumonia. In these evidences of malnutrition appear promptly, and are usually progressive. The anemia of tuberculosis, whether it occurs before or after the other symptoms, is usually simple and presents nothing characteristic.

Rectal vs. Vaginal Examinations in Labor.—BRIGGS, W. A. *American Medicine*, vol. iii, No. 5, p. 194, Feb. 1, 1902.

The information sought by digital examination is (1) the size and form of the pelvic cavity; (2) the presentation, size, mobility, and progress of the fetus, and the position of the presenting part; (3) the condition of the cervix and other soft parts, including the amniotic sac. Such information can be obtained without infecting the genital tract, by abdominal palpation, auscultation, and antepartum pelvimetry, combined with rectal exploration with the finger.

The preparation for digital examination by the rectum should be substantially the same as when the vagina is to be explored. The patient should be on the back with the knees well flexed, close to the edge of the bed. The examining hand should always be covered with a rubber glove. The index-finger in the rectum should, if possible, reach the promontory of the sacrum, while the thumb rests upon the pubis. In this way the conjugate diameter of the pelvis is readily estimated. Through the rectal wall the os and cervix can be readily recognized; if dilatation has begun, the alternate tension and relaxation of the cervical ring is noted. The sagittal suture and fontanels can be identified. To one making such an examination for the first time, the simplicity with which it is done and the clearness of the results are little less than surprising. The presentation of the fetus, the size, mobility, progress, and landmarks of the presenting parts, are precisely determined. The position of the fetus may be determined at an earlier stage by rectal examination than by the vagina.

Unrecognized Fractures in Children.—COTTON, F. J., and VOSE, R. H. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 2, p. 37, Jan. 9, 1902.

Reference is not made to gross errors in diagnosis, but to those fractures which may be readily overlooked because of an absence of symptoms. The systematic employment of the x-ray has demon-

strated that fractures without displacements are commoner than was formerly supposed, and may exist without being suspected. Such unrecognized fractures are frequent in children; in the latter there may be little pain or reaction, and they are less able to state their subjective sensations. A relative lack of symptoms does not exclude fracture in a child. If a detailed examination is omitted, a fracture may be overlooked, and while the outcome may be good, neglect of fixation usually results in excessive callus formation, and if in the lower extremity, increased lameness. The danger in overlooking such cases is not due to the actual difficulty in diagnosis so much as in an adherence to the general notion of disability and pain as accompaniments of fracture. The classical "green-stick" fracture is readily recognized, but there may be a "subperiosteal" fracture, in which symptoms are slight. In eighteen cases cited by the writer, there was nearly always some difference in the use of the limbs and some limitation of range of motion. In all cases of doubt the skiagraph was used, and in only one instance did this method fail to confirm the clinical diagnosis.

FORENSIC MEDICINE.

Masked Epilepsy with a Criminal Complication.—Dewey, Richard. *Milwaukee Medical Journal*, vol. ix, No. 10, p. 203, 1901.

The case reported is one of epilepsy of a very unusual character. A young man 21 years of age was an inmate of the Milwaukee Sanitarium for three months. An indictment for burglary had been returned against him, but the circumstances were so peculiar as to raise a doubt of the patient's mental integrity. There was no question but that he had broken into a dry goods store in the night, where he had been captured by an officer. At the time he had two pairs of socks in his possession, the price of which was a nickel a pair. The patient had previously borne a good reputation.

The mother of the patient was in early life migrainous. The father was of an irritable disposition, and had been a sleep-walker in youth.

The patient stated that ever since he could remember he would have spells, when he would have to lie down; sometimes these attacks were accompanied by a blank period. When five years old he would often give up play, seem sick, and go to bed, being dull and indifferent for four or five days, not answering when spoken to. Something of this nature has taken place every six weeks or so up to

date. These attacks have come on at night occasionally, as the patient would often be heard groaning, and the "spell" would show itself in the morning, the patient failing to get up as usual. These attacks interrupted school work. On the night when he was arrested he had been engaged in driving an omnibus, meeting the midnight train as usual, but four hours later was found in the store into which he had broken. When accosted by the officer he made no attempt to escape. When he was told of his act he seemed indifferent and denied all knowlege of it.

The patient stated that in the "spells" he was never unconscious except on one occasion, when he was driving, and, nine miles from home, all knowledge left him, and the next thing he knew he was putting out the team at home. The last thing he could recollect he was approaching a railroad crossing nine miles distant.

The three months' residence in the sanitarium revealed no vicious tendencies, though he was allowed to go about freely, not knowing that he was under careful observation. He never took liquor in any form, and while at the sanitarium gave up the use of tobacco, in which he had indulged, the deprivation costing him a severe struggle.

The physical examination showed a high-arched palate, muddy complexion, constant sweating of hands and feet, tongue coated, appetite good with an excessive fondness for meat, digestion impaired, constipation, and gaseous distention. The knee-jerks were exaggerated, vision and pupils were normal, there was a tremor of eyelids and tongue, the voice was tremulous, sleep disturbed. The urine was negative, and the pulse 80.

Shortly after his admission, while playing cards in the hall outside of his room with his attendant, the patient suddenly and unexpectedly put down the cards, got up and went to his room, put on his overcoat and cap, and started downstairs without saying anything, and went to the village. The attendant spoke to him repeatedly, but received no reply. The attendant finally turned him about, and they returned to the sanitarium, the patient not speaking. He seemed dull and confused, and the attendant helped him to undress. At about 12.30 the same night he got up, dressed, and extracted the keys from underneath the pillow of the attendant. He opened a locked window screen, and went down on the fire-escape; at 3 A.M. he found himself lying in the snow near the sidewalk in the main street in the village. He thinks he had fallen down, slipping on the snow, and that this woke him. He got up and returned to the sanitarium. He seemed dazed, but went to bed

and slept until noon. On awakening, he had no recollection of what had happened to him after he stopped playing cards until he found himself lying in the snow in the village. Under bromides the patient steadily improved, gaining in weight and in physical and mental activity.

The writer regards the case as one of larvated epilepsy, and the attacks of unconsciousness and automatism as psychical equivalents.

A Case of Poisoning by Mercuric Iodide.—BRUMMITT, ROBERT. *Australasian Medical Gazette*, vol. xx, No. 11, p. 476, Nov. 20, 1901.

Shortly after the ingestion of tablets containing mercuric iodide an adult woman was taken with severe pain in the abdomen. Later she fell to the floor and became unconscious. When observed by the physician she was lying flat on her face with extended arms. There was marked muscular rigidity. At the first glance she appeared to be dead. The face was dusky, the eyes closed, the conjunctivæ insensitive, the pupils dilated, and the radial pulse imperceptible. A careful examination showed a cardiac impulse and feeble respiratory movements. A change of position was followed by improvement in the breathing and a return of pulsation at the wrist. There were no signs of corrosive action about the mouth or lips, or of vomiting. One-tenth of a grain of apomorphine was given hypodermically, which caused vomiting of dark, poorly digested food; later the stomach was washed and white of egg administered. Three hours after the poison was taken the patient was out of danger, though she complained of some soreness of the throat and burning of the stomach. During the following night there were frequent evacuations of the bowels.

The tablets contained one-twentieth of a grain each of the red iodide of mercury. About six tablets were taken, hence the dose did not much exceed one-fourth of a grain. Poisoning by this salt of mercury is rare. From the small dose in this case the writer argues increased susceptibility on the part of the patient.

Death from Spinal Meningitis Following a Fight.—JAMIESON, SIDNEY. *Australasian Medical Gazette*, vol. xx, No. 12, p. 561, Dec. 20, 1901.

The case reported is that of a boy 16 years of age, who died suddenly. Six days before he had a fight with a boy younger than himself. He shortly afterward complained of pain in his head, and three days later, while lying on a sofa at his home, he was suddenly taken with convulsions and fell to the floor. He lost consciousness and remained in that condition until he died three days later.

The post-mortem examination showed a recent abrasion about a centimeter in diameter, situated at the outer angle of the right eye. The pupils were equally and widely dilated. The lungs showed some hypostatic congestion, but were otherwise normal. The thoracic and abdominal organs were not involved, the kidneys alone showing some cloudy swelling.

On resecting the scalp, no signs of recent or old contusions were found. There was no fracture of the skull. The entire surface of the bone beneath the membranes was thickly coated with a yellowish-green purulent exudate, which extended down the whole length of the spinal canal. The temporal bones were carefully examined, the internal ear, mastoid antrum, and middle ear being thoroughly explored, but no sign of disease was found. All the other accessory sinuses of the skull were examined, but nothing was discovered. The tonsils and nasopharynx were normal.

Smear preparations made from the exudate on the surface of the brain showed an oval-shaped diplococcus in large numbers. Morphologically, they resembled the gonococcus, but were somewhat smaller. They were frequently found in the interior of the leucocytes. These organisms stained readily by Gram's method. Cultures were not made, but the organism was identified as the diplococcus intercellularis meningitidis of Weichselbaum. The post-mortem showed that the case was one of spinal meningitis and not septic meningitis from wound infection, as was first suggested by the case. It is interesting to note that eighteen months before this case occurred, three similar cases were identified in the same neighborhood.

The sequence and sudden development of the symptoms following a trauma show how easily such a case might lead to a diagnosis of death from violence.

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ORIGINAL ARTICLES.

SOME RESULTS OF HEARING-TESTS OF CHICAGO SCHOOL-CHILDREN.[1]

BY D. P. MACMILLAN, PH.D.,
Department of Child Study and Pedagogic Investigation, Chicago Public Schools.

In this age of books and laboratories it still remains true that wherever instruction is imparted the unimpaired use of the sense of hearing is an almost indispensable necessity. I need only remind you of this to be assured you will agree with me that the ability to hear well is intimately connected with a pupil's power to make satisfactory progress in ordinary school work. The Department of Child Study and Pedagogic Investigation of the Chicago Public Schools since its inception in September, 1899, has made, merely as part of its work, careful tests of the pupils' hearing in every school it has visited. The data obtained are all the more valuable as those schools were chosen which were as free as possible from the disturbing noises of the city, and which would represent as far as could be expected normally healthy Chicago children.

The tests were made with the use of the audiometer invented by Prof. C. E. Seashore of the Iowa State University, and which is described in detail by him in Vol. II of Studies in Psychology issued from that university. Of course, before anything like a comparison of hearing-tests of children can be made by investigators, some standard or basis must be decided upon. So far the problem of making a universal standard has not been solved. Results given

[1] An address given at the Detroit meeting of the N. E. A. July 12, 1901, before the Department of the Deaf, Blind, and Feeble-minded Children.

in terms of the investigator's watch or voice certainly cannot be compared, nor no satisfactory conclusions deduced from them. It is believed that the audiometer has merits never before seen in an instrument used for the purpose of testing hearing. The apparatus consists of an induction coil, a battery, a galvanometer, a resistance coil, switches, and a telephone receiver, all done up in a convenient and portable hand-box. By turning a switch the dry battery can be thrown into the primary circuit of the induction coil. Another switch turns the galvanometer into the circuit. Then by varying the resistance by means of plugs, the fall of potential over the primary coil can be made constant as indicated by the galvanometer. The primary circuit can be opened and closed rapidly by means of a key, and as no stimulus can be produced save when the current is closed, the making and breaking of the current makes sharp clicks, which serve as a stimulus whose intensity can be varied at will by means of the secondary coil. This secondary coil is wound in forty sections arranged in a series on the basis of the number of turns of wire that each contains. Each of these sections is connected with the surface terminals in such a way that the number of sections indicated on the scale can be thrown into the circuit by a spring contact, and by moving the carriage along the scale to the proper terminal one can vary the energy communicated to the receiver in this circuit. In determining the relation of stimulus to sensation the inventor has followed the psychophysical law so that the ratio of the increments in the sound is such that the forty grades in the series are as far as possible psychologically equal. A tentative norm was taken by testing the hearing of intelligent, active, healthy persons of all ages. This served merely as a guide for the work and not as an absolute criterion. The work with the seven thousand pairs of ears, each taken individually, served to make its own standard. In the early thousands the position of the norm began naturally to appear. Thus, if 85 or 90 per cent of the pupils tested, and who were found by the other tests to be normally healthy Chicago children, were marked at a certain number, the position of the norm could be determined with reasonable accuracy.

The test was made in the following manner: As the pupil entered the quiet room he was seated at one end of a table, at the other end of which the operator sat. With the receiver at one ear and the other ear closed to exclude possible disturbances, by slightly pressing the tragus of the ear backward, the pupil awaited the signal for the test to begin. At first the register was set at such a part of the scale that a distinct clicking sound could be heard. The sound

was then made to decrease in intensity until the point was reached where it could no longer be sensed. This descending threshold was then marked. In order to rid the test of the errors of expectation and the trace of after-images, care was taken that the responses were not uniformly in the affirmative. As the limit of hearing was approached, the current was alternately turned off and on, while all the movements of the experimenter remained uniform, and these blanks in the sensation series served as a guide for the subject as the experiment progressed, and as a check upon the accuracy of the responses for the operator.

The experiment was further checked by proceeding in the opposite direction — *i.e.*, from below the threshold of hearing to a point where the sound was distinctly sensed. The results secured in these two ways were averaged and the pupil's record obtained.

In considering such an important subject as the hearing of schoolchildren, the number of problems that emerge is almost illimitable. There is opportunity only for a brief consideration of a few of them. The first that naturally appears is the relation between hearing and school life, or a comparison of the number of defects found at the different ages. In the study of this problem the pupils were grouped as to age by years, and at each age the percentage of pupils having defective hearing was calculated. A pupil is classed as "defective" when it is found from his audiometer record that he would be seriously inconvenienced in detecting sounds of medium intensity—*i.e.*, four or more points below the norm.

TABLE I.—SCHOOL LIFE AND HEARING.

Age.	Number of pupils tested.	Defective in one or both ears.		Defective in both ears.		Defective in right or left ear.	
		No.	Per cent.	No.	Per cent.	No.	Per cent.
6	341	52	15.2	22	6.45	30	8.79
7	473	76	16.0	32	6.97	44	9.30
8	545	123	22.56	47	8.62	76	13.94
9	555	96	17.29	39	7.02	57	10.27
10	598	88	14.71	38	6.35	50	8.36
11	558	88	15.77	39	6.98	49	8.79
12	608	86	14.13	31	5.09	55	9.04
13	599	82	13.69	35	5.94	47	7.75
14	664	103	15.51	38	5.72	65	9.79
15	664	108	16.26	39	5.87	69	10.39
16	555	84	15.13	40	7.20	44	7.93
17	377	56	14.85	29	7.69	27	7.16
18	192	38	14.59	8	4.16	30	10.43
	6729	1080	16.05	437	6.64	643	9.55

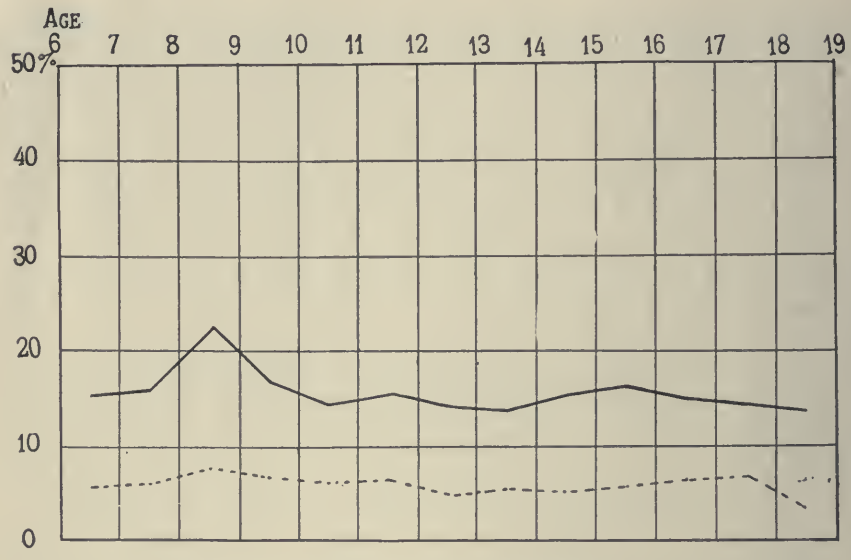

CHART I.—Hearing and school life: The heavy line shows defect in one or both ears. The dotted line shows defect in both ears.

It will be seen that on their entrance to grade work in school at the age of six years, 15¼ per cent of the pupils are found defective in aural acuity. One has only to reflect for an instant upon this fact to recognize its significance. In following the movement of this curve throughout the school years one can readily observe the general trend of these defects. The percentage of children having defective hearing increases rather rapidly in early school life, reaching its highest point at the early age of eight years. After all allowance is made for the fortuitous character of making tests not entirely objective with children under ten years of age, and for the climatic conditions of Chicago, the rise of the curve is very remarkable. It probably means that catarrhal affections and children's diseases are beginning to make inroads into the young lives, and indicates quite clearly the inability of the organism to adapt itself readily to this sedentary life.

From the age of eight the curve gradually descends, until between the years of twelve and a half and thirteen and a half the percentage of defects is at a minimum. At thirteen years of age it is found that only 13¾ per cent of the children have defective hearing. This in itself is very important, but doubly significant when one considers that it is the period in which an exaltation of all the powers takes place, a time of greatest growth and development, when not

only increased power in all directions is found, but according to many reliable statisticians, the lowest mortality.

Practically the same story is told when one considers the number of children found defective in both ears. The maximum and minimum number of defects are found about the same ages, with a general coincidence from point to point to the curve (shown above) obtained by tracing the number found defective in one or both ears.

In general, of the 6729 schoolchildren between the ages of six and eighteen, tested for aural acuity, 1080 of this number—*i.e.*, 16 per cent—were found defective in hearing in one or both ears, and are liable to be at a great disadvantage unless the presence of such defects is known in each case. Again, 6¾ per cent of the total number are found defective in both ears. Further, 9½ per cent of the total number of children have either the right or left ear defective, and need especially to be cared for and seated on the proper side of the teacher, in order to be able to utilize the unimpaired ear to the best advantage.

Even if one limits oneself to the sense of hearing, one could scarcely advance a more telling argument for the individual care of the children.

This large number of defects will not be surprising when one bears in mind the prevalence of acute catarrhal inflammation of the middle ear which follows in the wake of pharyngitis, or any of the acute infectious diseases. It is a rare parent that has not had experience with the common diseases of measles, scarlatina, whooping-cough, pneumonia, bronchitis; and the cases of tuberculosis, meningitis, and syphilis are by no means uncommon. Further, the presence of adenoid growths, enlarged tonsils, together with nasopharyngeal catarrhs in not a few cases, helps swell the number of after-effects that destroy or mar the delicate mechanism of hearing.

In reviewing these changes of the hearing power throughout school life, one naturally inquires if there is any causal connection between defective hearing and the pupil's ability to advance in the prescribed school courses. This problem presented itself to the Department of Child Study in its investigation of the wider problem of the physical basis of dulness. It is found that the conclusions advanced by Gratsianoff of Russia, and W. Townsend Porter, formerly of St. Louis, are substantially correct for the limited range of the test made by them. The dull and backward pupils were not only smaller and lighter than the brighter and more advanced, but

the children who are mentally superior on the average showed physical superiority in every test and measurement.[1]

This does not mean in the case of hearing that no child afflicted with dull hearing can be bright enough to be at or above grade, but it does mean that on the average defective hearing hinders the progress of the child in school work.

In investigating this problem of hearing and school standing, the pupils were divided into two groups. Those in or above the proper grade for the respective ages were placed in one group, while those below grade formed the second lot. The percentage of pupils subnormal in hearing, in at least one ear, was calculated for each age in both groups.

TABLE II.—HEARING AND SCHOOL STANDING.

Age.	School standing.	Number tested.	Pupils defective.			
			In one ear.		In both ears.	
			No.	Per cent.	No.	Per cent.
8.	At and above grade.	460	101	21.95	36	7.82
	Below grade.	85	22	25 8	11	12 84
9.....	At and above grade.	370	52	14	21	5.67
	Below grade.	185	44	23.7	18	9.73
	John Worthy School.	6	3	50	1	16.66
10.....	At and above grade.	373	42	11.2	14	3.75
	Below grade.	225	46	20 4	24	10.66
	John Worthy School.	25	6	24	4	16
11.....	At and above grade.	317	36	11.3	10	3.15
	Below grade.	241	52	21.57	29	12.03
	John Worthy School.	51	10	19.6	1	1.96
12.....	At and above grade.	306	33	10.78	9	2.94
	Below grade.	302	53	17.55	22	7.02
	John Worthy School.	99	20	20	6	6 06
13.....	At and above grade.	339	46	13 56	14	4.10
	Below grade.	260	36	13 84	21	8.08
	John Worthy School.	114	27	23.6	8	7.01
14.....	At and above grade.	421	60	14.25	20	4.75
	Below grade.	243	43	17.69	18	7.40
	John Worthy School.	144	49	34.3	16	11.11
15.....	At and above grade.	465	70	15.05	27	5.54
	Below grade.	199	38	19 09	12	6.03
	John Worthy School.	111	25	22.5	7	6.30
16.....	At and above grade.	280	42	15	23	8.21
	Below grade.	275	42	15.27	17	6.19
	John Worthy School.	37	8	21.6	4	10.81
17.....	At and above grade.	190	26	13.68	12	6.32
	Below grade.	187	30	16.04	17	9.09
	John Worthy School.	14	2	14.3	1	7.14
18.....	At and above grade.	88	13	14.77	4	4.54
	Below grade.	104	25	24.04	4	3.81

[1] See Report No. 2, Department of Child Study and Pedagogic Investigation, Chicago Public Schools.

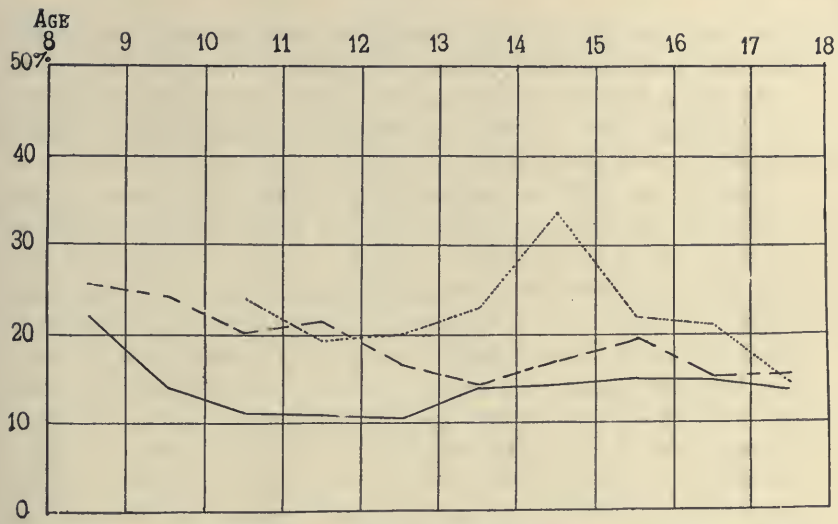

Chart II.—Hearing and school standing: Unbroken line, at and above grade; broken line, below grade; dotted line, John Worthy School.

By glancing at Chart II one can trace the relative position of these curves throughout. Before the age of eight years a large majority of the pupils are in the first grade, and there is no below grade group. In the early years of school life a great many adventitious circumstances other than positive defects may combine to place a child below grade, but in the middle and upper grades of the course the great majority of those marked below grade are there because of inability to secure regular promotion. Now it will be seen that at every year of school life the children below grade have a larger percentage of hearing defects than those at or above grade. This relative position of the two curves is maintained throughout the years of school life with surprising uniformity. It seems to draw attention to the symptomatic character of hearing defects, for besides delimiting the field of sense impression, defective hearing may be an indication of lack of growth, of improper growth, of injury, or of diseased condition of the child. This means that defective hearing parallels other defects, sensory, motor, or of growth.[1]

This was strikingly evidenced in the examination made by the Department of the six hundred boys found in the John Worthy School, a school which is supported by the Board of Education for the benefit of the juveniles in the city prison. The percentage of

[1] See article by C. C. Krauskopf, on Some Results of Sight-tests of Chicago School-children. Proceedings of Illinois State Teachers' Association, 1900–1901.

defects by ages of these boys may be seen on the upper curve (Chart II), the seemingly great variability in portions being due to the comparatively small numbers tested. It is rather remarkable that they show a greater number of hearing defects than the so-called normal pupils who are found below grade.

Further, in marking defects of growth and movement, the Department of Child Study has always made note of defects of speech. This is a general term on the examination card of each child, and is used to cover such palpable defects as lisping, stammering, hesitation, and imperfect pronunciation of elementary sounds. The number of those having such speech defects in the John Worthy School was counted. Out of six hundred and one, there were ninety pronounced cases of such defects, and of this latter number, fifty-six were markedly subnormal in hearing—*i.e.*, 61 per cent of those having speech defects were defective in hearing. This may not surprise those who have as their concern the education of mutes, for it is very probable that in many cases the child who is subnormal in hearing is backward in using vocal organs for the same reason that the deaf child does not exercise the power of speech.

TABLE III.—HEARING AND SPEECH DEFECTS.

Age.	No. Tested.	No. having speech defects.	No. having speech and hearing defects.	Per cent of those defective in speech who are subnormal in hearing.
9	6	3	1	33.3
10	25	5	4	80
11	51	6	5	83.3
12	99	20	11	55
13	114	13	9	69.2
14	144	17	10	58.8
15	111	19	9	47.4
16	37	4	4	100
17	14	3	3	100
	601	90	56	61.11

When one calls to mind the great complexity of mechanism involved in the acquirement and use of the power of speech, and the relatively large area of brain exercised, one can the better understand this inability of the child who is defective in hearing to utilize vocal organs. It is not a matter of the sensori-motor arc becoming atrophied, but of not being developed, so that in this case the proper

coördination between the hearing area of the brain and those motor areas governing speech has not been set up, made flexible and responsive.

I am sure that this Department of Education for the Deaf, Blind, and Feeble-minded Children needs no urging to broaden its interests to take into consideration the well-being of those children who are neither deaf nor blind nor feeble-minded, but who are the so-called normal children, and nevertheless, limiting oneself to the sense of hearing, present the large number of 16 per cent as subnormal. It means that the children who come under your immediate charge have such pronounced defects that they become at once the objects of individual attention, and the powers and capacities which are available are appealed to, while the children who are subnormal in sensory power are often branded as stupid and wayward because of their apparent inability to keep pace with their more fortunate companions. Facility and ease in sense perception cannot fail to induce pleasure in further mental activity. On the other hand, the failure to remove difficulty in sensing is poor economy of mental energy.

The Department of Child Study of the Public Schools of Chicago is interested in every feature of your work. Your problems we appreciate, and your achievements we praise. Time forbids any further presentation of the immensely important problems before our Department, further than the facts relative to the sense of hearing, to which I have limited myself. I can think of no other department of school work than yours that can so readily appreciate their significance, and I have taken pleasure in presenting them.

THE OPERATIVE TREATMENT OF HEMORRHOIDS.[1]

BY CHARLES F. NASSAU, M.D.,
Surgeon to St. Joseph's Hospital; Physician to Dispensary for Diseases of Women, German Hospital, Philadelphia.

In deciding upon the best operation for hemorrhoids, one must bear in mind the requirements of the particular case. The procedure to be employed is usually not difficult; frequently it is a harder task to convince a doubting patient that the few days in bed and the suffering which must be endured will be more than compensated by the relief obtained. That there should be some dread of operation is natural, when we consider that the patient is not cured even when discharged from the hospital, but enters upon a trying period of convalescence and more or less suffering caused by the ulcerating surfaces which have been left by the sloughing away of ligatures or the granulating areas left by the clamp and cautery.

The clamp and cautery, as well as ligature methods, in treating hemorrhoids, have often been followed by perfect recovery; especially is this true when the operations have been performed by those who have had abundant experience and with an approved technique. A study of the underlying conditions in hemorrhoids and a comparison with varicose conditions in other parts of the body show the lack of true surgical principles underlying these methods of treatment. No one would think of operating upon a varicocele by pinching up the side of the scrotum including a bunching of veins, and then cutting off the mass in a haphazard fashion and searing the stump with a cautery. A rational method for treating hemorrhoids is based upon the same principles, namely, a removal of the distended blood-vessels as high as may be necessary.

What is known as the ambulatory treatment, by which is understood the injection of certain substances which coagulate the blood within the lumen of the vessel, has been recommended by some. It is now generally agreed that this method is not applicable to external hemorrhoids. This treatment in the hands of one of my assistants, even in internal hemorrhoids, has been followed by abscess. Da Costa (Modern Surgery) says: "The injection is rarely curative, is painful, and may produce hemorrhage, phlebitis, pyemia, stricture, and even death." Some persons will submit to repeated injections, knowing nothing of the possible dangers, who could not be induced to take a general anesthetic and lose several days in bed. In operating for hemorrhoids local anesthetics may be used, although

[1] Read before the North Branch, Philadelphia County Medical Society, Jan. 16, 1902.

it increases the difficulties of operation. In the treatment of small internal hemorrhoids in which the distress is largely due to abrasions or small fissures, it may be sufficient to stretch the sphincter at the same time the fissures are cauterized; or the tumor is split down to its base; or, best of all, a complete excision followed by careful suture. Minor cases of isolated external hemorrhoids should be removed by excision of the veins, followed by a suture of the wound in the skin. The principles involved in this treatment are the same as are employed in the treatment of varicose veins in other parts of the body.

I am firmly convinced that extensive procedures are not needed in such cases, and that a perfect cure follows the slight operation which I have indicated, nine times out of ten, when proper hygienic measures are instituted and the patient is taught the necessity of daily attention to the bowels.

Those cases in which hemorrhage occurs form the more important group. The amount of blood lost varies from a few drops to a quite free hemorrhage. In some cases the protrusion of the hemorrhoidal mass may be of large size. It is in these cases in which the operation which is about to be described affords the best results. In 1892, while a hospital resident, I assisted in the performance of a Whitehead operation. Two years later, while in England, I saw a number of other cases so operated, and I agree with Da Costa when he says that only a surgeon who can master violent hemorrhage should venture to perform it. In Whitehead's operation the entire pile-bearing area is dissected out. The severed mucous membrane is pulled down and stitched to the surface. It is stated that this operation is sometimes followed by stricture and occasionally by incontinence. The operation, while correct in its basic principles, is faulty in certain details. The stripping off of the mucous membrane exposes a large open wound to infection. There is no provision made for sliding the mucous membrane; hence, when the pile-bearing area is cut away, the upper healthy mucous membrane is sutured to the lower margin of the anus, with resulting tension and sometimes a cutting through of the sutures. In pulling down the mucous membrane the muscular walls of the bowel are folded upon themselves, forming a "dead space" to fill with blood-clots. In performing the operation too great dilatation is often required, and secondary hemorrhage occasionally occurs on account of the absence of contraction.

The method I employ is one learned while assistant to Dr. Halsted at the Johns Hopkins Hospital, 1894–95, when I operated on my first ten cases.

The patient's bowels are thoroughly emptied by calomel and salts, followed by a copious enema to cleanse the lower bowel. The external parts are shaved and thoroughly scrubbed with soap and water, after which a sterile dressing is applied. In many cases operation can be performed under infiltration anesthesia or the local application of a solution of cocaine. It is usually better to administer a general anesthetic. The patient is placed in the lithotomy position with elevated pelvis. If local anesthesia is to be employed, morphine should be administered from one-half to three-quarters of an hour before operation. This lessens the nervousness and benumbs the general senses. Infiltration of the parts by a solution of cocaine one-tenth grain, morphine one-fortieth grain, in two hundred minims of normal salt solution, accomplishes a satisfactory degree of local anesthesia. It may be well to have at hand a freshly prepared one-per-cent solution of cocaine to inject in an especially tender area. Local anesthesia is applicable in old people and where the sphincter is to some extent relaxed, allowing easy protrusion of the hemorrhoidal tumors.

With ether anesthesia, the first step in the operation is a slight stretching of the sphincter, but it should not be carried to the extent of paralyzing the muscle. Through a speculum a gauze tampon is carried well up into the bowel; a circular incision is then made just within the margin of the skin. This incision includes more than one-half of the anal circumference, and is carried through the wall of the rectum until the fibers of the external sphincter are reached. Care must be taken to avoid injuring the latter; as a rule they can be easily stripped from the rectal wall. The bowel can be readily pulled down until the dissection is carried above the hemorrhoidal area. During the operation bleeding vessels must be caught as soon as they are cut, and, where possible, before. The dissection is facilitated by the index-finger in the rectum, which aids in preventing incision of the bowel. Before the incisions are closed, all bleeding points caught by the artery forceps should be tied. In this method of operating secondary hemorrhage is unknown, providing all bleeding vessels are ligated. As a rule it is not necessary to include the whole circumference of the bowel in the excision, if care has been taken to leave the healthiest portion unincised.

At this stage of the operation the hemorrhoids are cured—that is, the blood-supply to the varicose area has been completely cut off. Three interrupted subcutaneous sutures of silk are now placed in position to anchor the bowel to the skin. Each stitch includes the walls of the bowel, but does not puncture the mucous membrane.

The redundant hemorrhoidal tissue is then cut away by transverse incisions, bleeding points are ligated, and the skin and mucous membrane closely approximated by interrupted sutures of fine silk. In operations requiring a complete circular dissection, the anchoring sutures are introduced and the remaining work finished before the introduction of the final stitches. To obliterate any "dead space," a one-half inch rubber tube, four inches long, is wrapped with gauze until it has a diameter of about one inch. It is then covered with boric acid ointment and placed in the rectum so that it protrudes slightly from the anus. This should be done with the aid of a speculum. A cord should be passed through the protruding end of the rubber tube, to facilitate removal. This rectal plug should be removed in from six to twelve hours. In one case I allowed it to remain three days without special discomfort. At the time of removing the tampon, an opium and belladonna suppository will relieve tenesmus. On the fourth day the bowels are moved by divided doses of calomel, or by an enema of cottonseed oil followed by soap and water. On the sixth day the patient may leave his bed, and on the tenth may be discharged. Occasionally one of the anchoring sutures may give annoyance and require to be removed, but usually they come away of themselves.

In conclusion the following points commend themselves in this operation: (1) The sphincter is not injuriously dilated; (2) the wound is not open to infection from the bowel; (3) the blood-supply to the pile-bearing area is obliterated; (4) in the majority of cases little and in some no tissue is excised; (5) healing is rapid; (6) recurrence is a rarity.

UTERUS, GROSS SPECIMEN AND SECTIONS, ALSO SECTIONS OF THE LIVER, KIDNEY, AND BLADDER, FROM A CASE OF PUERPERAL SEPSIS DUE TO MIXED INFECTION BY THE COCCI OF SUPPURATION AND THE BACILLUS COLI COMMUNIS AND OTHER ORGANISMS—ALSO A PRELIMINARY CONSIDERATION OF A MORBID PROCESS AFFECTING UNSTRIPED MUSCLE (PARTICULARLY THE ELASTICA), NOT HERETOFORE DESCRIBED.

BY W. M. L. COPLIN, M.D.,

Professor of Pathology in the Jefferson Medical College.

[From the Laboratories of the Jefferson Medical College Hospital.]

Abstract of Clinical History.[1] — Mrs. O——, aged 20 years, American; admitted to Jefferson Maternity third day of labor, after repeated unsuccessful attempts at forceps delivery. Condition on admission: Temperature 97°; pulse 150; respiration 26; shock; slight delirium; uterus in state of tonic contraction; bladder greatly distended. Albuminuria, with finely granular and hyalin casts; urea 1.1 per cent; bacteria numerous. Vertex presenting. Highly contracted justo-minor pelvis. Usual treatment of shock. As thorough asepsis as possible; catheterization; craniotomy; delivery, fetus macerated. Uterine cavity curetted and packed with iodoform gauze. Transfusion; hypodermoclysis (repeated); stimulation; one intra-uterine douche. Exhaustion, death, second day after delivery.

Autopsy held ten hours after death. Anatomic diagnosis: Hemorrhagic and suppurative peritonitis; acute splenitis; diffuse nephritis; renal infarction (anemic); pyelitis; ureteritis; cystitis (partly hemorrhagic); septic metritis (puerperal); acute gastric dilatation; focal necroses in liver. Cause: Infection. Organisms found: staphylococcus pyogenes aureus, bacillus coli communis, diplococcus pneumoniæ, bacillus diphtheriæ (?).

Body of a well nourished female. Marked rigor mortis. Extensive suggillation over posterior part of trunk. Over the anterior abdominal wall and extending laterally are numerous subcutaneous hemorrhages; some are petechial, others more diffuse; none are over 0.5 centimeter, and majority scarcely more than 2 millimeters in diameter. Just below the right iliac crest is an old fibrous cicatrix 6 millimeters in length, 4 millimeters in width, its long axis approximately parallel to iliac crest. Skin of abdomen shows usual signs incident to pregnancy; pigmentation in median line conspicuous.

[1] For the privilege of using the clinical history in this case I am indebted to Prof. E. P. Davis.

Subcutaneous fat normal in quantity and texture. The extra-peritoneal fat is edematous.

On opening the peritoneal cavity there is found a small quantity of a brownish-white, flaky fluid (not sufficient to measure). This fluid posterior to the uterus yields an offensive odor; when the organ is raised and the pelvic cavity exposed it is found to contain a fibrinopurulent exudate which surrounds the rectum, occupying Douglas's cul-de-sac and supplying a filmy, grayish-yellow coat over the adjacent structures; the parietal peritoneum is beset with numerous hemorrhages (petechial and diffuse), and is markedly hyperemic; similar areas of rhexis are present over the intestinal coils, but are not abundant.

The spleen is attached by an old capsulitis to the diaphragm; the pulp is rather pale, the Malpighian bodies grayish, and the organ a little softer than normal.

The left adrenal is unusually large and measures 2.5 centimeters in length, 2 centimeters in width, 1 centimeter in thickness, shows areas of hemorrhage, and is somewhat edematous. Weight 10 grammes.

The left kidney is small, resists incision, the cortex is swollen and markedly striated; the capsule strips smoothly, subcapsular vessels are conspicuous, labyrinth and tufts are decidedly hyperemic, the intervening area pale and yellow. The pelvis and ureter are slightly dilated, moderately distended, and on section a mucopurulent fluid escapes.

The right adrenal is a small, club-shaped organ 4 centimeters long, 1.5 centimeters wide, 0.5 centimeter in thickness; it presents nothing noteworthy.

The right kidney cortex shows changes similar to those described as present in the left, the pelvis and ureter are distended, the former but slightly if at all dilated; contents same as on left side. The ureter presents an irregular sausage-like dilatation extending to the bladder; its size when distended is about that of a large thumb. About the middle of the kidney is an irregular, pale-white area involving most of the medullary portion. It is fan-shaped, the apex corresponding to the apex of the pyramid and radiating toward the cortex, which is partly involved; this is evidently an area of coagulation necrosis possessing the gross characters of an irregular anemic infarct. [NOTE.—As it was desired to preserve this organ as a gross specimen the area was not removed for histologic study.]

The bladder is moderately distended, reaching 6 centimeters

above pubes; its wall is thick, and the veins over the lower part of the organ distended and thrombosed. The mucosa of the bladder is irregularly mottled with purplish spots, which appear to be diffuse areas of hemorrhage situated in the submucosa. The contained urine is opaque, contains flocculi, and is slightly offensive.

The uterus extends to the umbilicus, is slightly pyriform; weight 700 grammes. Organ is flattened in its anteroposterior diameter. Just within the cervix posteriorly is a slough that marks the site of what appears to have been a laceration 2 centimeters in length and 1 centimeter in depth, its long axis corresponding to the axis of the organ; it does not extend through the uterine wall, but the underlying structures are soft, grayish-black in color—in other words necrotic, the necrosis extending to the peritoneal surface posteriorly. There is no solution in the continuity of the peritoneum. The organ is incised on its anterior aspect; the wall, at its thickest point, just above the middle, measures 3.75 centimeters. Fundus measures 1.75 centimeters in thickness.

The interior of the uterus is lined by a grayish-brown, soft, shreddy, necrotic mass of tissue spread quite uniformly over the entire surface of the organ; at points the grayish necrosis extends into the uterine wall to a depth of 0.5 centimeter; it gives off an extremely offensive odor. Just external to this layer is a grayish zone varying in width; at the fundus it approaches 1 centimeter in thickness, while toward the cervix it scarcely exceeds 4 or 5 millimeters. It is not uniform in breadth, and its outer margin is limited by an irregular reddish line from 1 to 2 millimeters in breadth. The grayish zone is evidently the area of extending necrosis, and the reddish line the limiting area of leucocytic infiltration and vascular dilatation. External to the reddish line the muscle shows no conspicuous gross change.

The peritoneal coat is roughened, red, and injected; over the posterior and inferior surfaces there is a slight, scarcely perceptible, fibrinous deposit that becomes more evident as the lower margins are approached. The ovaries are hyperemic. The Fallopian tubes seem slightly swollen; on opening them the mucosa is found to be reddened, but free from evidence of necrosis or suppuration.

The vaginal mucosa is turgid, at points purplish. Along the right wall extending from the vault downward is an irregular ragged slit with blackish necrotic sides and floor; it is not possible to determine with certainty that this was a laceration, as it seems probable that a similar condition might have resulted from infection and necrosis; it measures 5 centimeters in length. At a number of

FIG. 1.—Uterus laid open by incision through anterior wall. *A*, Scale, 1 inch. *B B B*, Cavities formed by extensive necrosis. *C*, Necrotic zone that, on its inner surface, projects as a shaggy layer, fragmenting stratum, and externally is bounded by *D*, the line of hyperemia and leucocytic accumulation (see Fig. 2). *E*, Muscle layer not presenting any conspicuous gross lesion. *F*, Peritoneal surface: early stage of serofibrinous inflammation (the block of tissue from which the microscopic drawing was prepared was taken from just above this point). *G*, Thrombosed sinus.

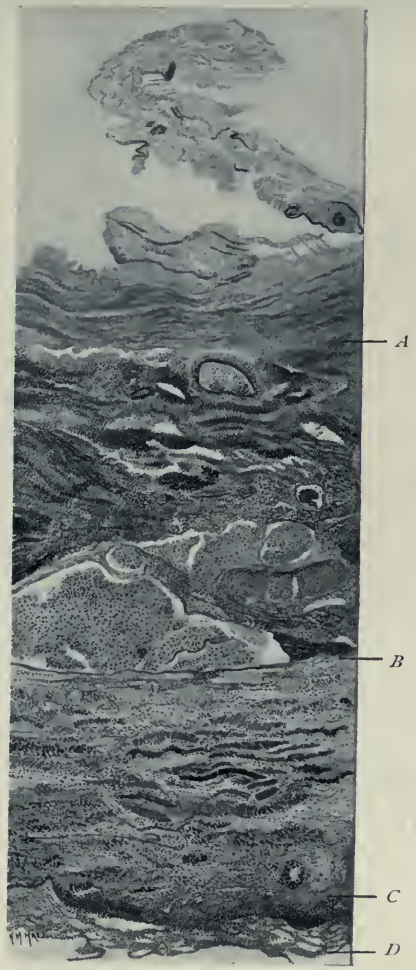

FIG. 2.—Uterus, fixed in Zenker's fluid; paraffin, eosin, and toluidin blue. (Obj., Leitz 16 mm., oc. compensation, and reduced two-thirds.) *A*, Above this point is the necrotic layer consisting of granular detritus containing enormous numbers of bacteria (see text), fragmenting histologic elements, and leucocytes. *B*, From *A* to *B* is the zone of hyperemia, leucocytic invasion, and progressing mycotic infiltration. Numerous uterine sinuses are shown, as well as arteries, all occupied by thrombi. *C*, From *B* to *C* muscle showing hyalin (?) change. This part of the section is only a narrow rim of the actual muscle; nothing would have been gained by showing the entire thickness. Just above and to the left of *C* is an artery the endothelium of which is proliferating. *D*, From *C* to *D* is shown the greatly altered serous covering. The layer represented in the drawing is largely composed of fibrin with entangled leucocytes and endothelial cells.

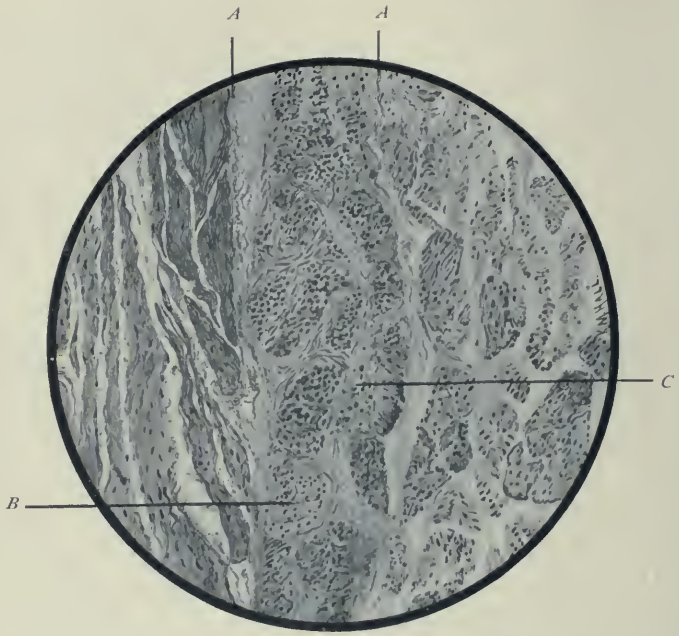

FIG. 3.—Bladder fixed in Bensley's solution, paraffin infiltration, stained with eosin followed by thionin. Composite field built up from different areas in the same section. (Obj., Leitz 16 mm., apochromat. compensating oc., reduced nearly one-half.) *A A*, Between these letters is a band extending vertically through the field and showing the most marked hyalin change. *B*, Area with marked intrafascicular hyalin change. *C*, With eosin and thionin this area appears granular, electing the acid dye. Between *C* and *A* is the larger part of a quadrant in which the nuclear fragmentation swelling and necrosis is marked; there is, however, less hyalin.

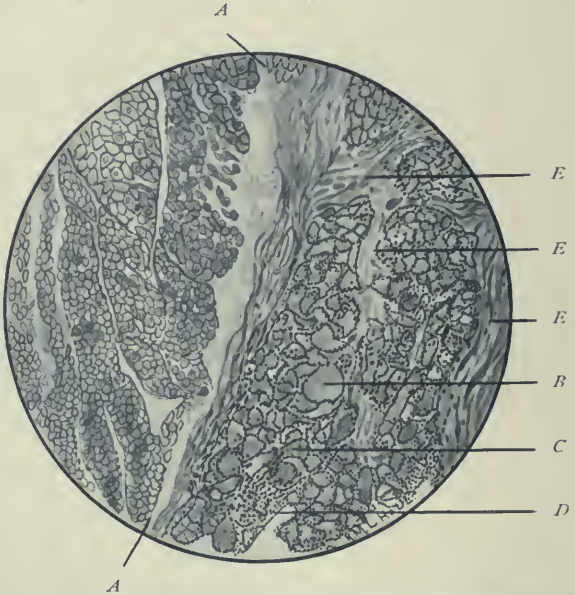

FIG. 4.—Bladder wall fixed in Bensley's solution, paraffin infiltration, stained by Weigert's method for elastica, followed by carmalum and picric acid. (Obj., 2 5 mm., homo. im., compensating oc., and reduced one-fourth.) *A A*, That part of the field lying to the left of leaders from these letters represents the practically unaltered fibers on transverse section. Cells sectioned through the nuclear areas show contained nucleus. The delicate pericellular structure electing the stain for elastica is shown. The area to the right contains a part of the muscle complex manifesting the change described in the text. The beaded elastica is universal; the smooth delicate fibrils shown in the normal field are absent. *B*, Greatly swollen cell. *C*, Fragmenting cell. *D*, Area from which muscle cells have largely disappeared. *E E E*, Swollen connective tissue that at points is granular.

points the mucous membrane is eroded and necrotic. With the exception noted above the necroses are superficial.

The vulva: The labia are edematous, although not markedly so. The urethral orifice is red and pouting. There is a slight laceration in the perineum. The external genitals and lower part of vagina are in better condition than internal genitalia.

The surface of the liver is beset with whitish areas, presumably areas of necrosis; on incision similar grayish or yellowish-white areas are disclosed; they are for the most part barely perceptible, rarely attaining a diameter of 2 or 3 millimeters. The remainder of the surface shows the usual cloudy swelling. Gall-bladder moderately distended by dark, viscid bile; ducts patulous.

The stomach is enormously distended, extending down to umbilicus. The duodenum is flaccid. Capacity of stomach estimated at 5000 cubic centimeters. It could not be demonstrated that the gastric dilatation was in any way due to kinking on superior mesenteric vessels and nerve.

The interior of the intra-abdominal alimentary canal manifests no conspicuous abnormality.

The pancreas shows no gross lesion.

Inoculations were made from renal vein, spleen, ureter, and interior of uterus.

Morbid histology: Specimens from the spleen, kidney, liver, uterus, and bladder were fixed, infiltrated with paraffin, and stained by the usual laboratory methods. The stomach was ordered preserved, but unfortunately the instructions were not followed.

Spleen: While this organ contains areas of focal necrosis, they are on the whole less conspicuous and less advanced than those in the liver. The pulp is everywhere distended by erythrocytes, rich in leucocytes, and unusually abundant are the large endothelial cells commonly present in many infectious diseases. As usual these show phagocytic activity, many containing fragmented erythrocytes and pulp cells. The pulp contains pigment and fragmented red cells; the Malpighian bodies are not unusually conspicuous. The fibrous tissue forming the trabeculæ is swollen, and the endothelial cells of the sinuses exfoliating and unusually prominent, although karyokinetic figures or other morphologic evidences of active proliferation have not been recognized. The changes seen, as indicated by the foregoing, are those usually found in the spleen subjected to the noxious action of toxic bodies circulating in the blood, and in particular the result of bacterial toxins.

Liver: This organ contains, throughout all the sections exam-

ined, multiple necroses. For the most part the areas of necrosis are small, rarely attaining a diameter of 2 millimeters, and in most instances are purely microscopic, involving but a small part of a single lobule. They are usually quite regular, although not constantly so, and are distributed in various areas of the organ, not always involving any part of the lobule, some being situated at the periphery and others more centrally. The hepatic cells are no longer to be recognized in the centers of the areas of necrosis. Usually toward the periphery can be seen, however, a hazy outline of cells the protoplasm of which is so far disintegrated that it no longer elects even such strongly acid dyes as eosin. The margin of the necrotic area is usually fairly defined, but often it can be observed that the change merges with the surrounding hepatic structure. A few polymorphonuclear leucocytes can be recognized in the areas of necrosis, and an occasional hyalin cell. There are masses of fragmented chromatin, evidently relics of the nuclear contents of hepatic cells. Evidences of regeneration are entirely wanting, and only a few cellular elements of the kind usually grouped among the scavenger cells that are supposed to be influential in removing this dead material are to be recognized. These cells are large, round or ovoidal—of that type described by Chantemesse and Podwyssotsky. The hepatic cells surrounding the areas of necrosis, and indeed practically all the liver cells, are advancedly granular, the cell outlines poorly defined, the protoplasm but faintly staining, the nuclei often indistinct, and in some instances fragmented. The capillaries are singularly free from blood; no evidence of rhexis in the perivascular tissues. The biliary channels, in most of the sections, are difficult to identify by reason of the granular and necrotic changes that have occurred in the canalicular epithelium. The epithelium when still present is usually granular, with poorly staining nuclei, and the cells not infrequently detached and lying within the lumina of the ducts. The endothelium of the capsule is swollen, at points detached, hyalin or advancedly necrotic, evidently participating in the associated peritonitis.

Kidneys: The blood-vessels of the capsule are intensely engorged, and at a number of areas immediately beneath the capsule accumulations of lymphoid cells are to be observed. Occasionally there is a small subcapsular extravasation; such areas of rhexis are, however, infrequent and minute. The changes observed in the cortex are for the most part restricted to the areas of the labyrinth. The epithelium of the convoluted tubules is often granular, desquamating, the margins of the epithelial cells no longer defined, the nuclei fre-

quently hazy, poorly staining, and in some instances the entire cell detached from the basement membrane. The lumina of these tubules almost constantly contain a finely granular, strongly acidophilic detritus, probably partly exudative in point of origin, but presumably, for the greater part, formed from fragmented protoplasm derived from disintegrated epithelial cells that have fallen into the tube. The intertubular tissue is often swollen, and in some instances occupied by lymphoid and plasma cells, the former predominating. The straight tubules of the cortex have not escaped changes similar to, though less in degree than, those already described as present in the convoluted tubules. The tuft changes are variable; some of the tufts are swollen, quite filling the capsule, others somewhat shrunken. In practically all of them there is a conspicuous excess of nuclei apparently belonging to cells largely, if not wholly, of the lymphoid type. Some of the tufts have retracted, or are compressed by a finely granular, intensely acidophilic material occupying the space between the tuft and external capsule.

The tubules of the medullary pyramids (Malpighian tubes, loops of Henley, etc.) are not profoundly altered, the epithelium does not stain with its wonted intensity, nor is its protoplasmic outline accurately preserved; many of the nuclei are diffusely stained, and but dimly outlined. The intertubular connective tissue is hyperemic, the vascular distention being more marked than in the cortical portion, in which blood-vessels are but moderately filled.

The pelvis of the kidney, the ureter, and the bladder show practically the same alteration; it is most advanced in the last named organ, which alone will be described.

Bladder: At no point in the vesical mucosa is the epithelium normal. For the most part it has exfoliated or is exfoliating, necrotic, staining poorly, its cells granular, often hanging by loosely attached necrotic shreds to the underlying structures. Beneath the epithelial layer the connective tissue matrix is swollen, hyalin, infiltrated by leucocytes, mostly of the polymorphonuclear type, and in a number of areas showing distinct hemorrhages. Sometimes along the entire margin of the submucosa for from 0.1 to 0.5 centimeter a diffuse erythrocytic massing can be recognized, although it is impossible to detect lesions in the vessel walls from which the erythrocytes have escaped. In some of the smaller blood-vessels adjacent to the mucosa the endothelium is swollen, and occasionally leucocytic margination can be recognized. Swelling is evident between many of the complexes or fasciculi in the muscle layer of the bladder, but such swollen tissue is usually quite free from leucocytes.

One of the most interesting conditions observed in this organ, and so far as the writer is aware not previously described in discussion of changes resulting from infection, is a type of hyalin or necrotic change clearly of the same kind as has been frequently observed and accurately described as occurring in the myocardium. In areas showing this change the following alteration can be found:

As will be evident later the appearances of the morbid process observed in the areas where the change is most evident are greatly influenced by the stain used. When the sections have been treated with the usual nuclear dyes—combinations of hematoxylin or carminic acid, thionin, toluidin blue, safranin, Unna's polychrome blue, or alkaline methylene blue, or similar basic dyes preceded or followed, as may be appropriate, by acid dyes—the results attained may be summarized as follows: The change does not appear to involve all of a muscle bundle (smooth muscle complex). In one instance less than one-half of a large band, itself less than 2 millimeters in diameter on transverse section, is involved. Under very low magnification it is easily seen that the involved portion of the muscle band containing a large number of fasciculi elects acid stains with intensity, while the remaining portion of the band possesses its normal tingibility.

Under a higher magnification (25 mm. obj. No. 1 eye-piece) it is seen that in this particular band the area involved has lost its sharp differentiation from surrounding fasciculi. The usual narrow, rather clear space that surrounds the normal complex is now occupied by a quite hyalin acidophilic substance.

Under still higher magnification it is observed that within the complexes the delicate connective tissue—protoplasmic bridges (?)—between the individual muscle cells is now replaced by a hyalin homogeneous acidophilic structure that quite obscures the individual fibers. The condition of the cells in the area involved varies at different points, and even adjacent cells show slightly different changes. The interpretation of the changes within the cells is rendered somewhat difficult by the fact that on transverse section no two cells are divided in exactly the same plane, and hence juxtaposed elements might manifest precisely the same changes, but appear different by reason of the position in the cell through which the section passes. I have not been able to secure a fully longitudinal section of a fasciculus showing the alteration in question, although some longitudinal bundles present evidences of the change. The transversely incised cells, the incision involving what by position and study of serial sections appears to be the nuclear area,

usually show no nucleus, or when present the nucleus stains but faintly or not at all; it is sometimes distinctly fragmented and often irregular, and not presenting its normal sharply rounded outline. Occasionally immediately around the nuclear area is a clear space, outside of which may be seen a narrow band or simply the ill defined periphery of the cell. In other instances the protoplasm will be found swollen, finely granular, intensely acidophilic, and without evidence of vacuolization. In some cells the nucleus is eccentrically placed; there is a distinct vacuole occupying the major portion of the transversely incised cell. The sharp outlines of the normal muscle cell are frequently lost in the hazy periphery that merges into the hyalin substance to which reference has already been made. Under magnification of 1000 diameters this hyalin substance presents at points granules, and occasionally a resemblance to fibrils. It is usually free from nuclei and cells. It is perfectly clear in some areas that it has resulted in part at least from disintegration of the protoplasmic tips and bridges of the muscle cell.

The most interesting disclosure of this extraordinary change is that afforded by sections stained first by Weigert's elastic stain, followed by some suitable nuclear and contrast stain. Hematoxylin followed by eosin, or better Van Gieson's mixture, yields satisfactory results, but by far the most brilliant findings are observed in sections stained with carmalum followed by picric acid. In sections stained for elastica it is found that nearly all that structure designated hyalin in the description of mounts stained by ordinary methods has now elected the elastic tissue stain and stands out as a most striking feature, enabling one even by the unaided eye to designate the areas in which the most conspicuous alteration can be seen. Under the higher powers of the microscope (2.5 mm. homo. im.) the muscle cells of the affected areas are found to be surrounded by a distinct limiting band of extreme thinness—a faint filament—that seems to bind adjacent elements together. In such areas the muscle cells show no conspicuous alteration, the nuclei staining about as the normal, possibly with slightly less intensity, but certainly not in a manner that, in the absence of other lesions, would attract attention. In the areas that, by other methods, previously showed in the most striking way the presence of such reactions as are commonly observed in many infections and usually looked upon as manifestations of hyalin metamorphosis, or coagulation necrosis, the body that previously elected the stains sometimes regarded as characteristic of hyalin now elects to a large degree the Weigert stain. The intercellular spaces immediately surrounding the muscle cells

are now occupied by the slaty-black, greatly altered elastica. In the uninvolved muscle complexus the elastica is a most delicate filament, smooth and uniform, lying closely to the adjacent cells; in the altered areas it is coarse, rarely filamentary, but rather nodular, looking like irregularly beaded strings that distend the intercellular spaces. It is evident that the elastica is swollen to two or three times its normal volume, and that in the progress of this swelling the muscle cells have been greatly altered. From the study, so far progressed, it is not possible to say that all the material that appeared hyalin is now shown to be elastica, but certainly an overwhelming preponderance gives a perfectly characteristic elastica reaction. The irregular nodular or beaded appearance would at first appear to be due to a pure sectional view of elastic fibers, but in the immediately adjacent unchanged muscle the reaction is that of lines surrounding the muscle cells, and only here and there the suggestion that dot-like bodies are really sectional areas of fibers. The possibility that muscle cells are surrounded by an elastic membrane has been considered, but no conclusion is as yet justified by the findings. If such a membrane be present it is reasonable to assume that it must be fenestrated, and hence on sections, when greatly swollen, the points of net-like junction would be most conspicuous. The lesion is so located in one of the blocks of tissue examined in this series that it has been possible to serial a complex through over one centimeter, and show that it follows and is largely limited to the complex involved, not extending, in this instance at least, to juxtaposed complexes, although a second complex showing the change was encountered while following out the first observed; the two were not apposed, but both are mesially placed in the muscle layer of the vesical wall.

The ultimate character of the alteration will be discussed in some later communication, in which will be recorded the results of study of the change in this form of muscle in a number of conditions and in the heart, for it has been possible to develop conclusive proof that the heart may be similarly affected.

As regards the peritoneal surface of the bladder the endothelium of the serous layer is for the most part exfoliated. The subserosa is swollen and infiltrated by both cocci and bacilli, and shreddy fragments of necrosing tissue project from the surface; the blood-vessels are intensely engorged and occasionally thrombosed; areas of true rhexis are not abundant. At points in the submucosa other than those mentioned, and in the subserous layer, a few extravascular erythrocytes can be seen, but the sections have failed to catch areas

in which the hemorrhage was shown clearly macroscopically. It is probable, however, that the appearance of hemorrhage was exaggerated in the macroscopic specimen by reason of the fact that the masses of necrotic tissue closely resembled distinct areas of hemorrhage. The richness of these structures in bacteria is one of the most conspicuous of the many abnormalities; cocci and bacilli are abundant in nearly all the sections, and so intimately associated that both must have been active simultaneously.

Uterus: Sections from a number of points in the uterus were prepared, but only those will be described that were taken from near the fundus on the anterior surface. In none of the sections so far examined has it been possible to detect the presence of placental tissue.

The conditions found are those of overwhelming infection, as evinced by the abundance of leucocytes, hyalin (?) and necrotic changes in vessels, connective tissue, and muscle, the presence of thrombosed sinuses, etc. The thrombi contain large numbers of bacteria, in some places the bacteria staining with such intensity that the individual elements cannot be made out even in the thinnest sections.

The inner aspect of the organ (uterine cavity) is formed by a hyalin and granular necrotic tissue in which but few cellular elements can be stained; shreds of uterine muscle project into the cavity and are covered and infiltrated by both cocci and bacilli; immediately beneath this necrotic layer is an intensely stained zone containing polymorphonuclear leucocytes, a few hyalin cells, and an abundance of cellular detritus and many bacteria. Sometimes in this zone and sometimes beneath it one recognizes the presence of thrombosed sinuses; the contained thrombi are composed of blood cells, many of which are fragmented, and a small amount of demonstrable fibrin. The margin of these sinuses is formed by walls of leucocytes, many of which are fragmenting, and within the necrosing thrombus innumerable bacteria are variously grouped. In some areas cocci predominate, in others the conspicuous organism is a bacillus possessing the stain reactions and morphology of a member of the colon group. While the thrombosed sinuses are often conspicuous near the inner aspect of the uterine wall, many are more deeply situated. Occasionally smaller vessels and even arteries are thrombosed, and around these one recognizes mantles of polymorphonuclear leucocytes constituting a veritable purulent infiltration of the perivascular tissues. The serous covering of the organ and the superficially placed muscle show practically all the changes

already described as present in the bladder. They are possibly less conspicuous, or it may be less advanced.

Bacteriologic Report.[1] — Specimen consists of agar tubes inoculated from the renal vein, uterus, peritoneum, right ureter, and spleen; and spreads made from the peritoneum.

No growths developed in the tubes from the renal vein and spleen.

The culture from the right ureter contains a bacillus that possesses the morphology and tinctorial reactions of bacilli of the colon group, and a coccus that corresponds to the staphylococcus pyogenes aureus.

From the uterus and peritoneum a pure culture of the same bacillus was obtained.

The spreads contain polymorphonuclear leucocytes, hyalin cells, and what are probably endothelial cells. There is also present an enormous number of bacteria. Some of the bacteria are arranged in irregular zoöglea, so that the individual organisms cannot distinctly be made out. Cocci are seen that correspond morphologically to the ordinary cocci of suppuration. Encapsulated cocci possessing the morphology of the diplococcus of pneumonia are also present. This organism was not obtained in the cultures, and hence its identification must remain doubtful. The spreads also contain intracellular diplococci resembling slightly the gonococcus, but they retain the dye by Gram's method.

Bacilli are also seen, some 2μ to 3μ in length, 0.3μ to 0.4μ in thickness, others 4μ to 5μ in length, with ends slightly clubbed. The bacilli first mentioned occur in pairs, ungrouped and in short filaments, and decolorize by Gram's method. The larger bacilli occur principally ungrouped, possess granules reacting to Neisser's stain, and retain the dye when treated by Gram's method; they resemble the bacillus diphtheriæ morphologically and tinctorially, but were absent from the cultures.

Remarks.—The lesion is undoubtedly one of mixed infection, the conspicuous organisms in the process being (1) the ordinary pyogenic staphylococci; (2) the bacillus coli communis or an allied member of the colon group; (3) bacilli that morphologically and tinctorially resemble the diphtheria bacillus—the last named are few in number, and were not obtained in culture; (4) diplococcus pneumoniæ.

The organisms found were distributed as follows: In spreads,

[1] I am indebted to Dr. Randle C. Rosenberger, Bacteriologist to the Jefferson Medical College Hospital, for bacteriologic examination and report here incorporated.

pyogenic staphylococci, diplococcus pneumoniæ, bacillus coli communis, bacillus diphtheriæ (?).

From the uterus and peritoneum pure cultures of a bacillus of the colon type, although films and sections show that in both situations other organisms were present. In culture from the right ureter a bacillus of the colon group and staphylococcus pyogenes aureus.

The examination of the viscera in this case was restricted to those mentioned, and the report is therefore lacking in fulness. The findings in the tissues examined are those expected in a septic process, and have been given in detail as completing so far as possible the anatomic picture with which the unique changes in the bladder, uterus, and ureteral wall were associated. The detailed study of the structural and microchemic alterations in the bladder wall seems to open a wide field for speculation and investigation. Changes in the muscle of stomach and intestine of the kind here recorded would elucidate many complex clinicopathologic phenomena at present not fully appreciated, *e.g.*, acute dilatation of the viscera named in many conditions—sepsis, peritonitis, inflammations of the mucosæ, typhoid fever, etc. The demonstration that, in this case, what appeared on first examination to be a form of hyalin degeneration of a type identical with that described in the heart, vessels, etc., or a form of diffuse coagulation necrosis, was later found to be the result of some change in the elastica, intercellular bridges, etc., suggests the possibility that what has been looked upon as a type of hyalin necrosis when seen in other organs or tissues, on further examination may prove to be the result of alterations in the elastica.

The condition observed in this case resembles closely, if it be not identical with, the described necroses that occur in the heart in various infectious diseases, and should further observation establish that in infections the unstriped muscle fibers of the body are liable to necrotic, coagulative, or other retrograde changes such as are well known to occur in the heart, we would have a satisfactory explanation of the dilatation of the stomach and intestine, yielding of the arterioles, overdistention of the capillaries, the occurrence of hemorrhage, and many other admittedly confusing problems. The comparatively recent introduction of an acceptable stain for elastica places us in a position to examine anew all those conditions upon which it promises to throw a flood of light; while the observations here recorded do not seem to justify any conclusion as to whether the change is initial in the elastica with secondary wasting and disappearance of the cell, or the reverse, it may be possible by a more

extended study of the subject to formulate a definite opinion as to this very important question. The two changes appear so intimately associated in the specimens examined that it seems quite impossible to separate them, and though studied by every method at my command, it has not seemed possible to give either precedence. Sometimes the pericellular elastica may be swollen slightly without conspicuous change in the cell body or nucleus; on the other hand the last named structures may be altered without evident abnormality in the elastica; but the overwhelming evidence is that the two changes occur together.

A CASE OF ANEURISM OF THE SINUS OF VALSALVA, WITH RUPTURE INTO THE PERICARDIUM.[1]

BY J. ALISON SCOTT, M.D.,
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Aneurisms of the first portion of the aorta are very commonly latent, and come under one of the three clinical subdivisions of Bramwell: first, aneurisms that are entirely latent and give no physical signs; secondly, those that give pressure symptoms, but clinicians cannot determine the nature of the lesion producing the pressure; thirdly, distinct tumors, with well marked pressure symptoms and external signs. Aneurisms occurring at or above the sinus of Valsalva are usually small and latent; their first symptom, Osler says, may be the rupture into the pericardium, with death. Above the sinus and along the convex border of the ascending aorta aneurism is frequent. It may enter the right pleural cavity or point forward at the first or second interspace. Here the sac is apt to compress the superior venæ cavæ, causing engorgement of the vessels of the arm and head, or only compress the subclavian vein, with enlargement and edema of the right arm. Perforation may take place; in a minority of cases it occurs into the superior venæ cavæ. If the aneurism develops from the concave portion of the aorta, the tumor or sac may appear at the left sternal margin. Sometimes the heart is dislocated downward, and the inferior venæ cavæ may be compressed.

The effect of hard work and continuous muscular exertion cannot be overlooked as an important causative factor in many of these cases. The dilatation of the aorta is not only the result of actual disease, but of the greatly increased strain upon the blood-vessels. Just above the aortic valves is a favorite site for aneurismal pouching and tearing of the vessel wall from sudden strain. W. T. Gairdiner, in Allbutt's System, cites several cases of sudden death due to rupture of the aorta at this point, from violent strain. Allbutt in 1871 (St. George Hospital Reports), and Myers in 1870, have called attention to the disastrous effects of continuous muscular strain upon the larger blood-vessels. Osler for many years has been accustomed to refer, in a pleasing way, to the liability of aneurism in those who have spent much time in offerings before the shrines of Bacchus, Vulcan, and sometimes Venus and Mars. Clinicians have for many years noted the extreme susceptibility of the negro race to early arterial sclerosis and its accompanying results. The mode of death in cases of aneurism at, or above, the sinus of

[1] Read before the Medical Section of the College of Physicians in October, 1901.

Valsalva is apt to be sudden hemorrhage, though at times pressure symptoms may antedate any evidence of hemorrhage; nor is it always that death occurs from the first hemorrhage.

The following case of aneurism of the sinus of Valsalva recently came under my care in the Pennsylvania Hospital and illustrates some of the preceding statements:

William W——, aged 28, single, colored, by occupation a fireman of a stationary engine in an ice manufactory, was admitted to the Pennsylvania Hospital on September 25, 1901. His father, mother, and one sister are living, and in good health. There is no inherited disease in the family as far as patient knows. He had the usual diseases of childhood. Has always been strong and healthy, doing hard muscular work. No venereal disease; has never used alcohol to excess, but smoked and chewed tobacco freely. States that his voice has always been weak and rather high-pitched.

The present illness began one week ago. While overheated he was sent from the engine-room into the ice storage room, where he piled up cakes of ice for four hours. Soon after leaving the ice-box he felt pain in the chest, behind the upper sternum, but continued to work for several days. On the day of admission to the hospital he was working in the hold of a fruit vessel unloading cargo. After having worked several hours, and while carrying a heavy bunch of bananas from the hold, he felt dizzy, and upon reaching the deck rapidly became unconscious. He was admitted to the receiving ward in a state of collapse, with imperceptible pulse, temperature of $96\frac{2}{5}°$, and shallow respirations.

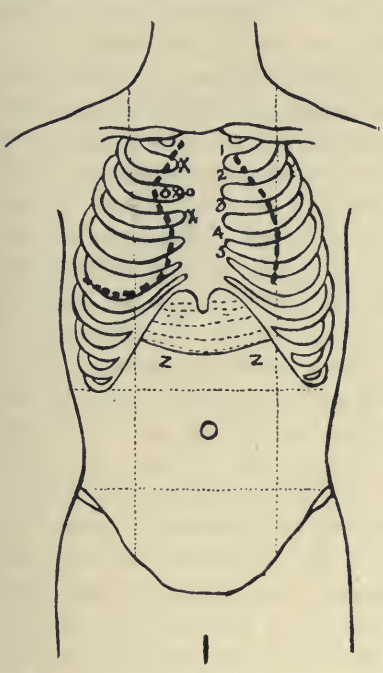
After free stimulation for several hours he reacted somewhat, though his temperature continued subnormal and the pulse was small and feeble. The next morning the following notes were made:

The patient is a large, well nourished, muscular mulatto. He is able to detail his history accurately, though evidently weak. The mucous membranes are pale. Tongue moist, with a whitish linear coat. Voice is high-pitched and feeble. Pulse 108, small volume, very compressible.

Chest broad, deep, and well formed. He complains of pain on both sides of sternum, and in epigastric region on full inspiration. Breathing is combined costal and diaphragmatic. Chest expands slightly more at left than at right apex. Tactile fremitus is present at both apices to nipple, absent below this on the left, present on the right side. The left lung is resonant. The right apex is resonant, with decided impairment in the first interspace near sternum, where the percussion is very painful to the patient. Auscultation:

breath sounds clear and breezy on the left side in front and posteriorly. Along the vertebral border at right base, at the seventh and eighth ribs, percussion note is decidedly impaired. Patient winces when this spot is percussed. On auscultation in front the breathing is subdued; over the impaired resonance behind, breath sounds are very faint.

Heart: During expiration, in the first and second interspaces on the right side and extending to the parasternal line, is a feeble and palpable impulse. The apex beat is feeble and palpable in the fifth interspace, just below the nipple line, 10½ centimeters from midsternum. Auscultation at apex: first sound rather dull; at second left, both pulmonic sounds extremely feeble; second right, a soft, systolic murmur, and a soft, reduplicated second sound. A systolic bruit is heard in the first, second, and third interspaces to the right of sternum, loudest in the second interspace. Percussion over the cardiac area shows an outline of dulness similar to that in the diagram.



The dotted lines show the area of cardiac dulness, due to the blood-distended pericardium: at x x x the systolic bruit was heard; at o o the patient was especially tender on percussion; z z, rigidity and tenderness in epigastrium.

The abdomen is rounded and seems normal, except in the epigastric region, which is fuller than usual and quite rigid and tender on either side of the ensiform. The edge of the liver is not felt. Splenic dulness is obscured by tympany. Extremities are normal. No edema is present. Pupils are equal. Radial pulses are synchronous and equal in volume. There is no tracheal tug. The urine is reddish-yellow, 1023; contains decided ring of albumin, no sugar. On microscopical examination numerous hyaline, granular, and epithelial casts, with many epithelial cells and leucocytes.

At 8 P.M. on the 26th the temperature had reached normal. The pulse still remained weak, though slightly improved in volume.

Two mornings later it was noted that the patient lies on his

back, breathing quietly, and seems stuporous. Pupils are slightly dilated, the right possibly a little larger than the left. The systolic murmur in the second interspace is louder and amounts to a rough rumbling. Second sound is blurred. There is no change in percussion outline on right side. Beginning at the seventh rib, between the vertebral border and scapula, is bronchophony, which extends to mid-scapular line. Tactile fremitus is present but lessened, not as distinct as at left base. The breathing is bronchial; no râles are heard.

The blood-count shows erythrocytes, 4,316,000; leucocytes, 13,700; hemoglobin, 95 per cent.

Death occurred at half-past eight September 28, three days after admission. The resident physician, Dr. Fraley, made the following notes in reference to his death:

"While making rounds, stopped by the patient's bedside, felt pulse, which was full, strong, though slightly dicrotic. When asked how he felt, he replied that he was perfectly comfortable, and he seemed in good condition. At 8.15 P.M. he took milk readily. At 8.25 the nurse heard him begin coughing and wheezing, and a moment later his head went back and he went into a tonic convulsion. I was only a few feet away, in the ward office, and reached him immediately. The head and neck were thrown back, pupils dilated and staring, the arms drawn up, with fists toward the chest and every muscle as tight as whip-cord. There was no pulse, and the patient was not breathing. The bed and the nightshirt were wet. After my arrival the patient relaxed, gasped three or four times, groaned feebly once or twice, shook his head, and was dead."

The autopsy was made eleven hours after death by Drs. Flexner and Longcope. The clinical diagnosis was ruptured aneurism of the aorta. The anatomical diagnosis was as follows: saccular aneurism of the ascending aorta; rupture into pericardium; arterial sclerosis; atheromatous ulcers of the aorta; multiple infarctions of kidneys; chronic passive congestion of kidneys, spleen, liver, and lungs; edema of lungs; perisplenitis.

For purposes of brevity, only the notes referring to the heart, aorta, etc., are given below:

Pericardial cavity: on opening the pericardial cavity it is found to contain 1500 cubic centimeters of bloody fluid, containing much dark, clotted blood.

Heart, aorta, etc.: The heart and aorta removed together. Left ventricle hypertrophied. The epicardium is covered with partly

decolorized clots. Average thickness of left ventricle 18 millimeters. Heart's flesh is firm and pale. The aorta is the seat of well marked nodular arteriosclerosis, which extends throughout the artery, growing progressively less in the abdominal aorta, and disappears at the origin of the iliac arteries. The chief elevation of nodules is about the lumbar and intercostal arteries. Mitral valves normal. There is a very slight thickening about the aortic segment. Above this segment, extending for the distance of 2½ centimeters, are partly decolorized adherent clots. Springing from the aorta above and corresponding with the right segment of the aortic valve, there is an aneurism, apparently globular, the size of a mandarin orange. Its approximate dimensions are 6 x 6 centimeters. The entrance to the aneurism is wide, circular in outline, 3 centimeters in diameter. The edges are irregular and covered with decolorized clots. The aorta within the aneurism shows advanced sclerosis. The entire aneurism is contained within the pericardium, the upper two-thirds being covered by the reflection of the sac and the great vessels. It lies against the upper and left lateral portion of the right auricle. At its inferior median border there is a rupture, linear formed, and measuring 26 millimeters in length. The edges are ragged. From this there projects a red, stratified clot, and the adjacent tissues of the heart are covered with recent clots in this location. The pulmonary artery is compressed apparently by the aneurism. The bronchi and esophagus are free.

This case from the start was considered one of aortic aneurism. From the man's history and from the post-mortem findings it is certain that death did not occur till at least two, if not three, hemorrhages had taken place. About the heart was layer upon layer of fibrinous clot, which had to be peeled off before the epicardium was reached. The physical signs at the right base at first led me to think that rupture had occurred into the right pleural sac, but within twenty-four hours consolidation appeared, and that idea was abandoned. The man insisted that about a week prior to admission he had suffered no pain, and had no cough. His first symptom, therefore, was pain, followed in a few days by rupture and hemorrhage, with death three days subsequently in the second hemorrhage. His convulsion was probably due to intense cerebral anemia.

1834 PINE STREET, PHILADELPHIA.

PARASITIC HEMOPTYSIS—THE PARAGONIMUS WESTERMANII; ITS PATHOLOGICAL SIGNIFICANCE IN MEN AND SOME OF THE LOWER ANIMALS.

BY WM. E. MAGAZINER, M.D., PHILADELPHIA, PA.

In the recent researches of the Bureau of Animal Industry of the Department of Agriculture, among some other parasites which were considered, there was brought to light one which, although known some time ago, has never until now been invested with any importance as far as the health of our citizens was concerned. The parasite is one of external origin; it is a long fluke of the genus paragonimus, family Fasciolides. One of the symptoms which attend the disease which this parasite causes—parasitic hemoptysis—so closely resembles those of other diseases, notably pulmonary tuberculosis, that its knowledge is for this reason alone relatively important. The cough, the expectoration of blood, anemia, disturbance of vision, are all symptoms which we find in other affections than this. Besides these, cortical epilepsy is a prominent manifestation when the parasite finds lodgment in the brain. This fluke particularly concerns us at this time on account of the number of our soldiers who have sought service in the Philippines, where they may contract the disease and bring it to this country, and also because it has recently been found in the lungs of American hogs.

It is a very wide-spread affection in Asia, and there is considerable cause for apprehension when we reflect that there is no obvious barrier to its rapid dissemination in this country. The parasite seems to be identical with those known variously as the *Distoma pulmonale*, the *Distoma Ringerii*, the *Distoma Ringeri*, and the *Distoma Westermanii*. It has been placed recently in a new genus, Paragonimus, erected for it by Braun. It was described originally by Kerbert, who isolated it from the lungs of a tiger which had died in Amsterdam. Since then it has been independently described by several observers. Baetz and Ringer are known to have discovered a parasite in the natives of Japan and Formosa, which is probably identical with it. Reilliet obtained it from a Japanese dog, and Ward from a cat. Only recently, however, has it been found in the hog in Cincinnati, and its relation to the parasite of hemoptysis proposed.

The parasite is of a fairly large size (8 to 16 millimeters long), pinkish or reddish-brown in color when alive, with an oval sucker and a ventral acetabulum of varying dimensions. It is oval in shape, somewhat round on cross-sections. The caudal end is generally slightly tapering. The cuticle is covered with broad, scale-like spines. The intestines are rather long, communicating with a very

short esophagus and a disproportionately long pharynx. Two testicles (described by some observers as being lobulated, and the one slightly posterior to the other) and one branched ovary are to be seen in the posterior half of the body. Organs of copulation are absent. The ovary is usually on one or the other side of the median line directly behind the main portion of the uterus, which is of varying size. The eggs are large, resembling in shape the fowls' egg, but varying much among themselves, both as to size and shape. Some are globular; others more elongate. It is to their dirty reddish-brown color that the characteristic brown tinge of the sputum of pulmonary hemoptysis is due in cases where blood is entirely absent. The embryo develops after oviposition, and is found usually within the lungs of mammals, there being as a rule two in each capsule.

There are but very small grounds for supposing that the parasite of Asiatic hemoptysis and that which has been variously described by the observers above quoted are not identical. The fact that it has been found in the tiger and the cat is easily conceivable when we consider that both animals are members of the same tribe, Felis. Its occurrence in the dog can be readily understood, since it would be thus but one of many parasites common to both the dog and cat. Its demonstration in the hog is, however, rather surprising, and we must bear in mind that several of the parasites of the hog find favorable conditions for their existence in man. The fact that up to the present time the organism has not been demonstrated in hogs of Japan, and in men of this country, is of but small weight as an argument of the identity of the American and the Asiatic parasites. It is true that comparisons between all the parasites claiming this title have not yet been made, but those that have been compared show but such minute differences that they may without hesitation be placed in the same genus.

As to the complete life cycle of the lung fluke, no satisfactory observations have yet been made. It is probable that the development of the egg does not take place until it leaves the nest in the sputum. Experiment has shown that the embryo cannot live in the sputum unless the latter be slightly diluted. It is improbable, therefore, that any development takes place within this medium alone. Kerbert and one or two other observers claim that they have seen the segmentation of ova up to the gastrula stage take place within the uterus of the parasite. Kerbert has, moreover, asserted that some of the ova are hatched within the host, claiming to have found the empty shells in his examination of a dog. This statement is probably due to an error in observation, Kerbert mistaking the cells from the yolk glands for the ovarian egg.

The embryonic stage of the *Paragonimus Westermanii* has been studied thus far by two observers at least. It is of an oval shape and provided with a small projection on its anterior extremity. Beyond this stage nothing absolute has thus far been demonstrated. The probabilities are that this is not the infecting stage of the parasite. The presence of the cilia seems to indicate an aquatic life, and we may readily presume that the intermediate host which this organism undoubtedly requires for its existence is one of an aquatic sphere. When the parasite finds its way to the water it is eventually ingested by some invertebrate, probably a mollusk, and after undergoing a stage in its development is taken into the body of man or other mammals through the drinking-water.

No other explanation thus far proposed as to the source of infection is satisfactory.

As to the prophylactic measures various Japanese authorities advise against the ingestion of raw eggs, uncooked fish, mussels, etc. It is advised also that the meat should be well cooked before eating. These measures are of course good upon general principles, but it is highly improbable that either eggs or meats are the sources of infection. Man and all the other mammals from which the parasite has been isolated are carnivorous. All these animals drink water, and as the weight of evidence is against infection through meat, it is highly probable that either the water or mollusks or both are to be held accountable for the dissemination of the parasite.

Our knowledge of parasitic hemoptysis is derived chiefly from observations of its occurrence in man. Up to the present time such observations have not been made in this country, but the view that the parasites found in the cat, dog, and hog are identical with the Asiatic form is of great significance. The fluke has been found in widely separated localities, and there is no reason that it could not in a short time infect man and become as widely spread as it is at the present time in Asia. This possibility is of itself of important medical bearing, but in addition to this there is to be considered a new source from which danger of infection threatens us. Previously the disease might have been transmitted to us from China or Japan by immigrants from those countries or by returning missionaries. Now, however, thousands of our soldiers are performing military service in the East, and there is great reason to suppose that some of these will become infected with the disease and bring it to the United States.

The symptoms of parasitic hemoptysis resemble those of pulmonary tuberculosis, and it is only by a microscopic examination that we can differentiate absolutely between the two diseases. It is

important, therefore, that we know of the existence of this disease even though it may never become a factor of medical importance in this country. The grounds for suspicion are, moreover, strong enough to justify the observance of special prophylactic measures, especially with reference to immigrants from the East and our returning soldiers.

The name "parasitic hemoptysis" is on the whole rather well chosen. It shows at a glance the nature of the infection and its principal symptom. It is a term which has now appeared several times in English books, and has been literally translated into German, French, Italian, and Spanish. It is well to remember that hemoptysis is the chief symptom only in the pure lung infection, and that even here it is not invariably constant. The lung infection, although by far the most frequent, does not stand alone. The name "paragonimiasis," suggested by Stiles and Hassel of the Bureau of Animal Industry, is more generally applicable and a better term, since it covers not only the pulmonary form of the disease, but also the infection of the brain and other organs.

The disease is exceedingly common in China and Japan. In some localities unofficial estimates have reached to 15 and 20 per cent of all the inhabitants. Some villages of the mountainous provinces of Okayama and Kumamoto are said to be absolutely pestilential.

The conditions of predisposition are not absolutely known. It is probable there is no positive condition of hereditary predisposition. It is questionable whether the fact that the disease has been found to be more prevalent in one class of people than another is due to any actual predisposition rather than to additional exposure to the infection. According to all accessible statistics the disease seems to be more common in men than in women, and in the young rather than the old.

Occupation affects predisposition only as far as it brings the patient into actual contact with the infective agent. It has been found more frequently in farmers, but this is due simply to the fact that they are as a rule more exposed to the disease than others. Personal habits and physical condition are factors of the same nature in this disease as in any other, for it is only to be expected that the man who is continually depleting his system by alcoholic excesses will be more likely to harbor the parasite than a more robust individual.

The prognosis in parasitic hemoptysis as far as it concerns the longevity of the patient is generally good. Extensive observation

shows that the disease may exist in a patient for ten or twenty years or even longer without causing death. Recovery is dependent upon several factors: a change of residence to a non-infected district frequently is sufficient to bring about a cure. The greater the number of parasites in the lungs, the greater of course will be the danger of severe hemorrhage or of cephalic embolism. Where the infection is confined to the lungs the outlook is more favorable than where the brain is entered either by the worm or its ova. In the young the disease checks proper development, and in the old it brings about malnutrition. The association of the disease with pulmonary tuberculosis is to be greatly regretted, since these cases present such conditions as call for a very grave prognosis.

Treatment thus far has been more of the nature of experiments than according to any definite procedure, and no treatment yet formulated is deserving any special recognition. Manson, proceeding under the supposition that the parasites were confined to the bronchi instead of the lung tissue, administered atomized inhalations of various drugs. The tincture and the infusion of quassia, the infusion of kousso, solutions of turpentine and santonin, were thus given. In two cases he tried inhalations of the fumes of burning sulphur. In one of these the cough and expectoration stopped, but the ova were still present in the sputum. The other case progressed so well that in three months the man was considered cured. On the other hand, Taylor states that the growth of this parasite cannot be hindered to any great extent by the inhalation of drugs which would not seriously injure the lung tissue. He prefers the use of tonics, quinine, iron, cod-liver oil, stimulants, and above all rest and good food. Taylor reports cases which were greatly benefited by this line of treatment.

The opinion of Japanese authorities is against the specificity of any treatment. Prophylactic measures they regard as the only recourse, although positive prophylaxis is out of the question as long as the cercaria stage of the parasite is unknown. The adoption of some general rules has done much, however, to prevent the spread of the contagion. The use of "sputum boxes" is of as much importance as in tuberculosis; their contents should be thoroughly disinfected before being thrown out, for there are no conditions better adapted to the growth of the parasite than those found in sewers. As a further preventive measure it is necessary not only to kill any animal in which this disease has been diagnosed, but the body should be burned as well.

The symptoms of the disease depend upon the location of the

infection and the severity of its type. Infection of the lung is the usual procedure. This may begin in such a mild, insidious manner that the patient cannot determine when he was actually infected. The first thing which he notices is a slight cough, which may be followed by a discolored expectoration. At the outset these attacks appear at rather long intervals, but there is a gradually decreasing interval as time passes until the cough may become almost constant. It is rare that the patient is forced to seek a physician at first. He may become curious to know why he expectorates pellets of blood, but as this may continue for several years without depleting his condition he may become accustomed to it. Physical examination except in the most severe cases is negative. As the disease progresses auscultation may disclose diminished respiratory sounds, which are usually bronchial in character. The temperature rarely rises; if it does so, the increase is very small and is seen only in bad cases.

Usually some edema is found, and occasionally marked anemia. All these symptoms are aggravated by exercise until even the most trifling exertion will bring about a marked dyspnea. There may be a feeling of extreme discomfort across the thorax. The sensation may be one of dull pain or merely a constant irritation.

The complications which may occur in "lung-fluke disease" involve the brain, the liver, and the other internal organs, the brain infection being the most serious. When the parasites gain access to this organ, the fact is heralded by epileptiform convulsions, or by sudden chills and fever or a feeling of extreme suffocation. Yet cases have been reported in which the onset was gradual, but the symptoms invariably grew severe as the disease progressed. The convulsions may become so severe that the patient may remain unconscious for a whole day at a time, although the mental faculties are usually clear in the intervals until a late stage of the disease. The eyesight on the affected side is usually impaired, a severe keratitis frequently setting in. Liver infection is comparatively rare; two cases have been reported of cirrhosis of this organ with ascites, in which the parasitic eggs were found in the interstitial tissues. In the other organs in which the cysts of the parasite have been observed (mesentery, great omentum, etc.) the changes produced were so slight as to bring about no symptoms of any consequence.

The post-mortem examinations have disclosed some interesting facts in the pathological anatomy of the infected organs. In the lung disease it has been noted that the external appearance of the organ is not perceptibly altered. The parasite exists in the smaller

bronchi and burrows into the lung tissue. On section these burrows are found very frequently to communicate with each other, and always with the smaller bronchi. The communication may be with the bronchus itself, giving that structure the appearance of having a sac-like dilatation on one side. Around each cavity is an irregular ring-like area of induration. The adjacent bronchioles and lung tissue are congested, and more or less inflamed. Old cavities are filled with ova, dead parasites, hematoidin, and débris. It is this material which forms with the bronchial secretions the characteristic dirty-colored expectoration.

The cause of the pulmonary hemorrhage has not been satisfactorily determined. Several theories have been suggested. The parasites attach themselves to the bronchial wall by their suckers, and when they release this hold, a little blood oozes out, appearing as pellets in the sputum. Larger hemorrhages are due to the rupture of capillaries or some of the smaller arteries. According to Baetz the bleeding is due to the passage of the larvæ from the circulation into the blood. Hemorrhage, however, seems to be an accident of the disease, and not an essential part of it, for it is occasionally absent. In these cases the expectoration is smoky or rusty and always contains ova. No ova have been found in the pellets of blood. What becomes ultimately of the parasite is unknown. Some are coughed up, and many die probably in the lung.

The pathological anatomy of the brain infection is rather interesting. Cysts containing parasites and eggs or merely eggs have produced embolism. The membranes are hyperemic, and there are adhesions between the pia mater and the hemispheres. The affected side of the brain is usually slightly swollen. Several bluish tumors may be noticed, which upon incision will be found to contain cysts. The cyst-fluid contains hematoidin crystals and many ova. The blood-vessels are enlarged and thickened, especially the intima, and some of their ramifications may be obliterated by emboli consisting of parasitic eggs. Around the parasitic foci are found areas of connective tissue formation and round-cell formation. In infections of the liver and other organs stellate cicatrices are found, in the center of which are nodules of variable sizes. Many are soft and doughy in the center and surrounded by several layers of connective tissue; others are very vascular and infiltrated with round cells.

It is the lung infection, however, which is the most significant; so significant, in fact, that the disease has received its name from this one symptom.

BULLET WOUND OF THE ORBIT: EYE DESTROYED BY A FRAGMENT OF BONE—A CLINICAL AND PATHOLOGICAL REPORT.[1]

BY CHARLES W. LE FEVER, M.D.,

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The principal interest in this case arises from the unique character of the injury, the immediate and complete blindness—with the comparative absence of other symptoms at the time of injury, followed by the long period of quiescence—and the pathological findings.

History.—William H——, aged 47. There is no ocular history of importance previous to the date of injury, which was April, 1895. At this time the patient, while in a restaurant with some friends, was shot by a ball from a 32-caliber revolver, the latter being held at nearly a right angle to the direction in which the patient was facing, and but a few feet distant. The ball took effect on the right temple about midway on a line drawn from the outer angle of the orbit to the top of the attachment of the auricle. At this point there is at present a small depressed scar in the skin, but no irregularity of the bone could be made out. The man was knocked down by the force of the ball, but says he was not rendered unconscious. He at once became blind in the right eye, in which he never perceived light afterward. He was taken to a near-by hospital, where his injury was dressed, and he remained under observation until the skin wound was healed. After that his eye received no attention, and presented no symptoms except excessive flow of tears, until about September 1, 1901. Photophobia and pain now began to trouble him, and the eye became red. This he allowed to continue without treatment for five weeks, when he came to Jefferson Hospital. At this time the uninjured eye had begun to show signs of sympathetic irritation. The right eye showed deep conjunctival and ciliary congestion, the cornea was hazy, the anterior chamber shallow, and the pupil completely occluded. In the left eye there was emmetropia, with normal visual acuity and the usual presbyopia for that age, which was prescribed for. The patient was kept under observation for a few days, during which there was no subsidence of the inflammatory process; and Dr. Hansell, having suggested the possibility of a piece of bone being driven into the eyeball by the bullet, enucleated the eye on October 18, 1901. No exploration of the orbital fossa was made, and the bullet, which had not been recovered at the time of injury, was not found. Healing was unin-

[1] Read before the Section on Ophthalmology at the College of Physicians, Philadelphia, Jan. 21, 1902, by invitation.

terrupted, with complete disappearance of disturbing symptoms in the other eye immediately after the operation.

Pathological Findings.—The eyeball was cleaned of adherent tissues immediately after removal, and measured as follows: horizontal lateral diameter, 24 millimeters; anteroposterior diameter, 21 millimeters. The globe was of about normal post-enucleation firmness, except over an area extending from a point 10 millimeters to the temporal side of the optic nerve to a point 2 millimeters to the nasal side of the nerve, and about 10 millimeters in its vertical axis at the widest point. This area was occupied by an irregular, resisting mass resembling calcareous formation within the eyeball, or, as had been suggested, a foreign body within the globe, possibly a fragment of bone driven from the orbital wall. Externally, the globe in this region was puckered by cicatricial formation and presented evidences of having had the continuity of its structures ruptured at the time of injury.

Macroscopical Specimen.—After fixing and hardening by formalin, and increasing alcoholic solutions, the eyeball was frozen and divided with a razor, by an anteroposterior vertical section, into two equal parts so as to retain the hardened mass in one half for better examination. The posterior two-thirds of each half was found to be occupied by a slightly yellowish, translucent mass, apparently an old blood-clot which was undergoing organization. In the center of this, on its surface, was an elongated white mass of tissue, attached at the fundus and free at its anterior limit. This was evidently the retina, completely detached and crowded to the center of the eye by the hemorrhage which took place from the choroidal vessels. Entangled within this tissue, and resting with its flat surface against the posterior wall of the eye, was found an irregular piece of bone, so close to the nerve entrance that on making the section through the nerve stump a small portion of the bone was cut away. The larger piece was extricated from the tissue in which it was embedded, and found to measure in its greatest length 9 millimeters, greatest width 5 millimeters, and greatest thickness 2½ millimeters. (In the

accompanying illustration the piece of bone is lying almost over the point from which it was extricated.) The lens was opaque and displaced entirely into the temporal half of the divided globe. It was not touched by the razor in passing through. Masses of hardened exudate were seen behind the ciliary body and the anterior portion of the choroid, having dissected these structures away from the sclera. The sclera, on the temporal side of the nerve entrance, was greatly thickened, measuring 2½ millimeters at the thickest point. The disk was obliterated. The iris and ciliary body were atrophic.

Microscopical Specimen.—The microscopic changes are so numerous, and their bearing so unimportant in relation to the points of special interest, that they will not be recited in full. Only such changes as are of special interest in relation to the gross lesions will be given.

The sclera on its nasal side, and in its anterior half elsewhere, is but little disturbed in its structure, but contains throughout a moderate amount of round-celled infiltration. In the region of the cicatrix there is complete disorganization of the scleral structure, and as the nerve is approached on the temporal side there is incorporated within the cicatrix detached portions of the retina. These are, of course, not structurally intact, and not all the layers can be found. They were evidently prolapsed into the wound and were not liquefied and absorbed in the process of repair. In no section could the optic nerve be traced through the sclera, its destruction having been so great. The masses of exudate behind the ciliary body and anterior portion of the choroid are for the most part homogeneous, but in places they contain round-celled infiltration and fibroblasts, with some formation of fibrous tissue loosely disposed. The remains of the blood-clot occupying so large a part of the vitreous chamber is also largely homogeneous, but contains numerous areas of what seems to have been fat cells, but which contain no fat at present, this probably having been dissolved by the action of the absolute alcohol and ether through which it passed in the process of dehydrating and hardening. The formation of fibrous tissue has not taken place within the remains of the clot, but there are many small round cells and a few fibroblasts within the areas of empty fat cells. The conditions of these two masses, the one an unabsorbed blood-clot and the other an exudative mass, are of special interest when it is remembered that over six years elapsed while these changes were taking place. The slowness of this process might be accounted for in part by the absence of direct blood-supply to the vitreous chamber.

The principal changes in the other structures of the eye were those of atrophy.

BOOK REVIEWS.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of G. P. Head, M.D. Volume I, "General Medicine," Edited by Frank Billings, M.S., M.D., with the Collaboration of S. C. Stanton, M.D. Chicago: The Year-book Publishers. October, 1901.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Volume II, "General Surgery," Edited by John B. Murphy, M.D. Chicago: The Year-book Publishers. November, 1901.

It is intended that ten volumes shall be issued each year, but they are so arranged that each volume may be obtained separately. They are uniformly bound. The books are comparatively small, measuring 5 by 7.5 inches, and yet the matter contained in them is nearly equal to that found in a much more imposing volume. This is not accomplished by decreasing the size of the type, which is large and clear, but the margins are narrow, and in this way the size of the work is kept within reasonable limits so that it may be conveniently slipped into the pocket, or held in the hand without too much fatigue. There has been a tendency of late years to make books unnecessarily large, this being a distinct difficulty in reading them. The plan adopted in the "Practical Medicine Series" is an improvement on the year-books now upon the market, in this respect.

Volume I deals with diseases of the respiratory and circulatory organs and the constitutional and infectious diseases. In a general way, those disorders which are most prevalent in the winter and spring are discussed. In the series of ten books which are to be issued, a second one on general medicine will appear in May, which will deal more especially with the disorders most prevalent in summer and autumn.

The volume has covered the ground. The editor states that it has been his aim not to give a full account of the literature, but to select the most important articles and to give abstracts of a satisfactory length. To any one familiar with the current literature of the year, the volume will appear as an excellent *résumé*.

Volume II, on General Surgery, edited by Dr. John B. Murphy, accurately presents the surgical work of the year. Its distinctly practical character is set forth in the editor's preface: "No longer will a good diagnosis suffice as the acme of professional attainment; treatment and more treatment is the slogan of the surgery of the year. It is not sufficient to know that a patient has hemorrhage from his middle meningeal artery; the hemorrhage must be controlled and the clot removed immediately. The intracranial tumor must not only be diagnosed, but removed before the adjacent cerebral tissue is destroyed. The tympanum and mastoid must be drained before the meningitis ensues. Aneurisms must be treated before they rupture, not after. Cardiac and vascular puncture must be sewed ante and not post mortem. Pulmonary hemorrhages must be stilled without the assistance of death. The hepatic, cholangic, and cystic infection must be drained before fatal sepsis ensues. The gastric, intestinal, and appendiceal ulcers must be treated before the onset of fatal peritonitis. Ureteral, prostatic, and urethral obstructions must be removed before the excreting tissue of the kidney is destroyed. To continue the enumeration

would be futile. It is evident to the practical surgeon that procrastination is surgery's curse, and the cause of its greatest fatality."

A natural arrangement is followed, beginning with a consideration of the various methods of anesthesia, operative technique, tumors, infections, etc. Then follows the diseases of special parts. While it is not intended that this shall be a work upon general surgery, but merely a year-book, yet it is surprising how very generally the whole field of surgery is worked over each year.

The typography of the work is in most respects excellent; a bold-faced type is used, which is clear and easily read. The paper is too thin, but is unglazed, and therefore pleasant to the eye. The low-calendered paper gives the cuts, excepting the insets, a very imperfect reproduction.

A Practical Guide to the Administration of Anesthetics. By R. J. Probyn Williams, M.D. London, New York, Bombay: Longmans, Green & Co. 1901.

The writer was prompted to the preparation of this work by the fact that he had been frequently asked to recommend a small work on the subject, and that none were available. The average student neglects the larger ones, and either reads nothing at all, or perhaps glances through the articles on anesthetics in some text-book on surgery. This book of 211 pages was written, not with the idea of rivaling the larger treatises of Hewett and Buxton, but with the hope that it would meet the needs of the student while he is receiving practical instruction in this branch.

The work opens with a general consideration of the administration of anesthetics. The term general anesthesia is restricted to that produced by inhalations with one of the agents commonly employed. Local anesthesia, or, to speak more correctly, analgesia, is described in the closing chapter. The preparation recommended to the anesthetist is quite formidable. He is advised to have at hand a gag and wedge, mouth props, tongue forceps, a case of tracheotomy instruments, and a hypodermic syringe with solutions of morphine, strychnine, and possibly digitalis, a cylinder of oxygen, an apparatus for intubating the larynx, and capsules of amyl nitrite. Special emphasis is laid upon the examination of the patient, and it is especially enjoined that under no circumstances should ether or any of its mixtures be given with the patient upright. If for any reason breathing is difficult, the anesthesia should begin when the patient is in the position that gives him the greatest comfort, and only when consciousness is abolished should the position be changed. Where there is a collection of fluid in the pleural sac, the anesthesia should be administered with the patient lying upon the affected side, which position should be maintained throughout the operation. During anesthesia, special stress is laid upon the character of the respiration. With ether anesthesia the respirations are usually audible, but with chloroform they may not be heard; nevertheless, they must be carefully watched. When the breathing is once deep and regular, it may be considered that the anesthesia is progressing satisfactorily. If it becomes too deep or too light, it may be that the dose is either too large or is not sufficient. The color of the face is the best indication of the amount of air that the patient is receiving; the pulse, the size of the pupil, the corneal reflex, and muscular movements are all valuable guides in the administration. Care is enjoined as to the treatment of the patient during recovery from

the anesthesia, and this relates especially to vomiting, thirst, shock, and the administration of food.

In discussing the difficulties and dangers of anesthesia, the writer says that trouble may arise through involvement of the respiration and circulation; one system may be affected primarily, but the other soon becomes involved. In many cases, when the condition of a patient on the operating table becomes serious, it is hard to tell which was the first to fail. The signs of failure of respiration and of circulation are given, together with a description of Sylvester's and Howard's methods of resuscitation.

Nitrous oxide, and nitrous oxide with oxygen, appear to be favorites with the author. There is an extensive description of the apparatus required. The average amount of gas to produce anesthesia is stated at six gallons, but with patients addicted to alcohol a larger quantity is required, while in children a very few breaths may be sufficient to give complete anesthesia. The opinion is no longer held that nitrous oxide causes lividity, stertor, or jactitation; these are simply due to the exclusion of atmospheric air. An apparatus for administering nitrous oxide and oxygen is cumbersome, requiring usually three cylinders of the nitrous oxide and one of oxygen. It is claimed that the mixed gases give a longer and quieter anesthesia. The return to consciousness is not always as rapid as where the nitrous oxide is used alone, and there may be some headache, giddiness, and nausea. A somewhat similar result may be reached by allowing the patient to inhale a certain amount of air with the nitrous oxide, but this implies more experience on the part of the operator.

In giving ether, the writer favors the Clover or Ormsby inhaler. In children, or old people with degenerate arteries, it may be well to precede the anesthesia with a few drops of chloroform or A. C. E. mixture. Anesthesia may be obtained by administering ether by the rectum, but this may be followed by diarrhea, and deaths have occurred when it has been used in this way.

When chloroform is used, a simple wire mask covered with a single layer of lint is sufficient, but here the quantity that reaches the patient and the amount of air admixed cannot be measured. In a Junker's inhaler, 14 per cent of chloroform vapor is administered, and the quantity that reaches the patient can be definitely known. The cases that are said to be suitable for chloroform are young children or old people, those with bronchitis or other chest troubles, cases of operation on the brain or about the face, especially if a cautery is to be used, abdominal operations, and where a slight degree of anesthesia is to be maintained, as in parturition. Much the same rules are to be followed in noting the condition of the patient that are employed in ether narcosis. The A. C. E. mixture and equal parts of ether and chloroform are said to be useful in certain cases, but like all anesthetics they have some disadvantages.

The relative safety of the various anesthetics is stated in the following order: Nitrous oxide either alone or mixed with oxygen, then ether, then mixtures of ether and chloroform, and, last of all, chloroform. The choice of the anesthetic depends upon the condition of the patient and the necessities of the operation.

The chapter on local anesthesia is the least satisfactory in the book. The writer refers to the fact that it is little used in England, owing to the extensive employment of nitrous oxide, which takes its place. Bier's method of spinal analgesia is dismissed with the curt remark: "No record of the use of this method in this country [England] has as yet been published."

We have reviewed *in extenso* this valuable little work, hoping that it will be widely read in America, where a more scientific and accurate administration of anesthetics is sadly needed.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M.D., Assisted by H. R. N. Landis, M.D. Volume IV, December, 1901. Philadelphia and New York: Lea Brothers & Co.

The successive volumes of this valuable quarterly maintain the high standard of the earlier issues. The first article is from the pen of Max Einhorn, on the diseases of the digestive tract and allied organs. In it is abstracted about all that has been added during the past year to our knowledge of the diseases of these structures. The writer follows the rule of abstracting the most of the important articles with very little comment.

W. T. Belfield, in speaking of gonorrhea, says that there is an increasing tendency to recognize the necessity of using all available means of diagnosis. Cases of blood infection by the gonococcus, identified by cultures, have become more numerous. In the treatment injections are still used, because the ideal remedy which shall be administered by the mouth and thus destroy all the gonococci in the genito-urinary tract has not yet been found. The potassium permanganate method is deservedly falling into oblivion, and the silver salts are steadily gaining favor. Nargol has of late somewhat displaced protargol.

A considerable portion of the chapter on surgery, by J. C. Bloodgood, is devoted to a study of anesthetics. The writer says that surgeons are no longer bigoted in expressing their opinion as to which is the best and safest general anesthetic. Local anesthesia has been accepted as a proper substitute for general anesthesia in cases in which the latter is contraindicated. Spinal anesthesia is stated to be as yet in its experimental stage. While ether and chloroform remain the drugs of choice, nitrous oxide, ethyl chloride, and ethyl bromide, either alone or in combination, demand consideration. The present knowledge of practical anesthesia renders it unjustifiable for any surgeon to use one anesthetic exclusively. The three factors in safe anesthesia are stated to be: (1) Choice of the anesthetic best adapted for the individual to be operated and for the character of the operation to be performed; (2) the best method and technique for producing anesthesia with the particular agent; (3) a skilful anesthetist.

Diseases of the intestines are discussed by John Rose Bradford. Oxaluria is summed up by the statement that it is to be looked upon as a urinary derangement, consequent upon gastric disorder, and not as a manifestation of a diathesis. The treatment should be eliminative, together with administration of those remedies which prevent fermentation in the intestinal tract. The latest view in functional albuminuria is that so-called postural albuminuria is not a clinical entity, but simply a variety of albuminuria, and that the effects of posture favor the elimination of albumin by the kidneys in all cases in which it is present, the influence of posture in the elimination being some index of the severity of the process. Albumosuria is again attracting some attention, eight cases having been described within the last three years, the total number now on record being thirteen. This argues for the rarity of the condition, as fifty years have elapsed since Bence Jones described the first case. Bright's

disease in the young, the nephritis of pregnancy, the varieties of uremia, and the relation of cardiac hypertrophy to renal diseases, are adequately discussed.

Albert P. Brubaker says that the physiological work of the past year has been in nowise startling, and scarcely anything new of importance has been brought forward. The majority of investigations are simply confirmatory of, or antagonistic to, previously asserted details. The Hull Laboratory of Chicago is complimented on the continuance of its activity, and its work is reviewed.

Henry B. Baker, in discussing recent advances in the department of hygiene, devotes especial attention to bovine and human tuberculosis, the spread of yellow fever, the restriction and prevention of intermittent fever, and the bacteria of sewage.

The volume closes with a practical therapeutic referendum by E. Q. Thornton.

INFANT FEEDING, IN ITS RELATION TO HEALTH AND DISEASE. By Louis Fisher. Philadelphia: The F. A. Davis Co. 1901.

The second edition of Fisher's work has been called for within six months. The author has taken the opportunity to add a chapter on infant feeding in summer complaint, and some new suggestions on the diet of older children. The work begins with a description of the physiology of the infantile stomach and a statement of its capacity. There are several outline drawings giving the actual size of the stomach of the infant at different periods, which serve to remind one of the small size of this organ in early life. That portion dealing with the physiology of the parts is simple, only so much being stated as is of value to the clinician. The general method of describing the infantile organs is to contrast them with the adult. Thus we are told that the liver in nurslings is larger than in adults; that the glands of Lieberkuehn are fewer in number than in adults; while the glands of Brunner are numerous and well developed. This arrangement is excellent, as it serves to emphasize the unity of physiological processes in the young and adult; at the same time it states the numerous differences.

The writer does not favor the addition of milk-sugar to infants' food; such addition being often followed by the appearance of milk-sugar in the urine. It has been demonstrated that bacteria are abundant in commercial samples of milk-sugar.

The bacteria of the infant intestine is comprehended in the description of the bacillus coli commune and its numerous congeners, and the bacterium lactis aerogenes.

The practical deductions in breast-fed infants are that additional food should be given when the child is six months old. This may consist of raw egg, meat soups, barley or other cereals. With a normal condition of the bowels, wheat flour ball can be given every few days. The addition of hydrochloric acid to food, as a routine measure, is to be condemned.

The value of wet-nursing is emphasized by the statement: "If the infant's own mother cannot nurse her child, then we can and should try to secure a wet-nurse." The directions for obtaining a wet-nurse are specific. In reference to weaning we are told that this must be done when the weight is below normal, and that prolonged nursing may cause rickets.

In the hand-feeding of infants there is found all of the more recent methods. If there is a criticism of this part of the book, it would be that the author

is not sufficiently dogmatic; he sets forth most of the approved methods, but does not give us his individual preferences. This is a bad plan for the beginner, as he is often left in doubt as to the method he should choose when several are described. The writer has succeeded in pressing into this little work nearly all that it is useful for one to know on the subject of infant feeding, which has grown to be one of the most important departments of pediatrics.

THE CHILD: A STUDY IN THE EVOLUTION OF MAN. By Dr. A. F. Chamberlain. London: Walter Scott, Limited, Paternoster Square. 1900.

The present volume is intended as a study of the child in the light of evolution, and as an attempt to record and if possible to interpret some of the most interesting and important phenomena of human beginnings in the individual and in the race. The statements in the chapter on the helplessness of infancy are too strongly put as to the distinctions in this particular between man and the lower animals. Certainly there is a period in all of the lower animals when they are helpless as long proportionately in certain particulars as man. Even in the birds and reptiles such a period of helplessness occurs. While in the oviparous mammals such a period is short, still in the viviparous marsupials the period of helplessness is comparatively long. Practically the period of nursing must be considered in the light of marsupial development as a period of maternal environment of the offspring. This period seems to be much longer in many of the primitive races than in the higher. In many of the pigmy races nursing may last three years. The influence of mother-right on this has yet to be studied, and to this topic Dr. Chamberlain devotes too little attention. In his discussion of the relation of adolescence he fails to note the influence of the struggle for existence between the reproductive system and the cerebrospinal system, and the necessity for a prolonged period in which this struggle should take place. The lesser this period the greater the gain of the primary ego and the purely individualistic animal type at the expense of the secondary ego and intellection. The failure to recognize these factors mars the whole of Chamberlain's work. The same deficiency is noted in the ignoring of certain American researches outside of those of a New England circle and its connection. The work contains factors of interest and value, but will need serious revision along the lines of psychiatry, ethnology, and anthropology.

AMERICAN EDITION OF NOTHNAGEL'S ENCYCLOPEDIA: TYPHOID FEVER AND TYPHUS FEVER. By Dr. H. Curschmann. Edited, with Additions, by William Osler, M.D. Authorized Translation from the German, under the Editorial Supervision of Alfred Stengel, M.D. Price, $5.00. Philadelphia and London: W. B. Saunders & Co. 1901.

In the editor's preface Dr. Osler writes that the original edition of Curschmann's work on typhoid fever and typhus fever has been regarded as a standard authority upon the subject. Numerous additions have been incorporated into the original text so that it reads smoothly, there being no special distinguishing marks which enable one to say what has been contributed by the editors. In many respects this is a distinct advantage, as we are saved the irritation of constantly referring to foot-notes or of being stopped by the ever-recurring parenthesis. The principal additions include a statement of the bacteriology of typhoid fever, particularly in reference to the appearance of

bacteria in the urine, rose spots, and in the blood. The chapter on perforative peritonitis has been practically rewritten, as has the section on hepatic complications of typhoid fever. The distribution of the bacilli in the localized complicating lesions of typhoid, which have been the subject of such extended study in the last two years, are incorporated in the present volume. We shall not attempt an extended review of this work of 646 pages, but will merely refer to the fact that the original was written by one of the leading authorities of Europe upon this subject, and has been edited by William Osler in this country, whose practical knowledge of typhoid fever is second to none. This combination easily makes it the leading monograph upon typhoid.

A Manual of the Practice of Medicine. By George R. Lockwood, M.D. Price, $4.00. Philadelphia and London: W. B. Saunders & Co. 1901.

The second edition of Lockwood's Practice comes to us considerably augmented, it having reached the dignity of a treatise. It contains 847 pages. We are not sure that the increased size of the work is an advantage, as in its first edition it was a very compact compendium, which was useful to the undergraduate, and contained the essential outlines of medical practice. Among the new sections in the last edition are those upon bubonic plague, gastroptosis, gastric analysis, and Reichmann's disease. The subject of malaria has been entirely rewritten. A work that was printed in the latter part of 1901 should contain some reference to the recent experimental work upon yellow fever. The writer says: "The disease is introduced into cities chiefly by freight and merchandise, and quarantine and disinfection are successful if thoroughly performed." There are a few other recent contributions to medical literature which are important, and which seem to have escaped incorporation in the text. On the whole, the volume is a well printed and compact statement of medical practice.

Outlines and Epitome of Special Pathological Histology. By Docent Dr. Hermann Dürck. Translated from the German and Edited by Ludvig Hektoen, M.D. Price, $3.00. Philadelphia and London: W. B. Saunders & Co. 1901.

This volume is one of Saunders's Series of Hand Atlases. It completes the special pathological histology, the first volume of which was reviewed in Medicine some three months ago. The third and remaining volume will deal with general typhlologic histology. This volume contains 123 colored illustrations on 60 lithographic plates. The pictures are excellent and come as near enabling one to recognize actual anatomical conditions as plates are ever likely to come. Every drawing is clear, the outlines are distinct, and the coloring has evidently been made directly from an original specimen. The volume deals with the liver, urinary and sexual organs, nervous system, skin, muscles, and bones. The text is brief, and at the same time sufficient to enable the student to get a fair idea of the pathologic significance of the various illustrations.

LEADING ARTICLES.

BIOLOGICAL PECULIARITIES OF THE TETANUS BACILLUS.

Always a matter of interest and more or less of a puzzle to those who have endeavored to study it, the tetanus bacillus has presented itself quite recently under a number of unusual conditions and given rise to unfortunate results. These occurrences and the uncertainty of their origin makes it appropriate to review, briefly, the known facts regarding the biology of the specific tetanus organism.

Discovered by Nicolaier and cultivated by Kitasato, the tetanus bacillus was first known as a microörganism of infected wounds. It seems, however, to have its natural habitat in the soil with which it is conveyed to the wounds. It is a microörganism of wide distribution, but occurs chiefly in soils that are well fertilized, therefore provided with the necessary nutritious matter upon which it lives. It has recently been urged that the soil is not the natural habitat of the organism, but that it enters it in the intestinal evacuations of herbivorous animals, especially horses, and that the large numbers found in the intestines of these animals show them to be its natural habitat. The finding of the microörganism in the intestine and its chief occurrence in fertilized soil make this reasonable did we not have to account for its original entry into the intestine of the animals, and did we not find certain soils replete with tetanus bacilli yet rarely reached by animals by which it should be polluted. It, therefore, seems more probable that the tetanus bacillus, being a microörganism of the soil, accidentally enters the alimentary tract of the animals, in which it is found, upon the roots and stems of the plants upon which they feed. The nutritious contents of the intestine and the anaerobic condition there prevailing would thus afford it an excellent opportunity for growth, so that its numbers might be greatly increased and its distribution subsequently favored. It does not seem reasonable, therefore, to believe that the tetanus bacillus lives a purely parasitic existence.

The chief morphological peculiarity of the bacillus is the occurrence of large round spores at the end of the organism in which they occur. Spores, however, frequently occur at or near the end of other bacilli, though very few possess round spores. The appearance of the bacillus is, therefore, fairly characteristic, though a few other microörganisms closely resemble it.

One of the chief biological peculiarities of the tetanus bacillus is its refusal to grow in the presence of uncombined oxygen—*i.e.*, its

obligatory anaerobic nature. This has been urged against its existence as a microörganism of the soil, it being said: How can a microörganism unable to grow in uncombined oxygen live in the soil? There are, however, many other obligatory anaerobic organisms peculiar to the soil, the tetanus bacillus being simply one of a number of bacilli sharing anaerobic peculiarities. Such microörganisms must find the necessary anaerobic conditions in the soil, arising from proximity to strongly aerobic organisms by which the free oxygen is rapidly absorbed, or by proximity to putrefactive organisms by whose gaseous products the oxygen is displaced.

The tetanus bacillus is pathogenic for man and for most of the lower animals. Its pathogenicity depends upon the production of a powerful soluble toxin with a marked affinity for the motor cells of the nervous system. By the action of this toxin upon the nerve cells, the tonic spasms characteristic of the disease are brought about. The blood and juices of the animal body contain loosely combined oxygen, which is inhibitive to the growth of the tetanus bacillus, so that its development in the body of any animal must be accomplished with difficulty. So far as is known it never circulates in the blood of the infected animal, but maintains a strictly local growth. According to our knowledge of its biology, it would be impossible for it to live or multiply in the blood because of the presence of oxygen. The conditions most favorable for its growth and development are those accompanied by the best anaerobic conditions, so that we find it developing in the human body in conditions similar to those of the soil—*i.e.*, in association with other microörganisms that have accidentally entered with it and through whose local action suppurations, necroses, or other tissue injuries are brought about. It seems to be true that the tetanus bacillus requires some such association of other bacteria in order to grow in the abnormal environment of the animal body, and that it must be furnished with devitalized tissue or associated with some oxygen absorber in order that appropriate conditions for its growth shall exist. This is well illustrated by the fact that when the spores of the tetanus bacillus are washed free from their toxic products and injected into the animal suspended in distilled water, they are harmless, although the same spores in a broth culture in which the metabolic products of the bacillus are present develop and cause the animal's death in a short time. Again, these washed spores suspended in distilled water, and harmless by themselves, if introduced into the body simultaneously with some chemical irritating substances—lactic acid, etc.—are able to develop on account of the abnormal local condition brought about by the

irritant. From these fundamental facts it is evident that the results following the introduction of tetanus bacillus into an animal will vary according to the conditions accompanying such introduction, and that the same result is by no means to be expected in all cases. With tetanus it may truthfully be said that "it is the unexpected that happens;" thus a punctured wound of the foot caused by stepping upon a nail may be unaccompanied by suppuration or other signs indicative of conditions favorable to the growth of the tetanus bacillus, yet tetanus may speedily follow such a puncture because a few spores or bacilli carried in by the nail have found the traumatic injury sufficient to permit them to multiply in the devitalized tissue.

On the other hand, incised wounds into which the earth has been carried in considerable quantity, lacerated wounds made by instruments soiled with earth and into which the earth has been ground, having an appearance suggestive of the most grave danger, may be harmless as regards tetanus, because conditions necessary for the growth of the tetanus bacillus have not developed, and in spite of the fact that the microörganisms *may* be there, their growth is impossible. It is impossible to tell by examining the wound whether tetanus is likely to develop or not. It may be taken for granted that every wound infected with earth may be followed by tetanus.

The time at which the disease makes its appearance—that is, the period of incubation—varies in accordance with conditions not yet known. If the tetanus follows vaccination and depends upon microörganisms contained in the vaccine virus (a matter not yet proven), the prolonged period seen in such cases may be due to the fact that it is not until the vaccine organism has occasioned a considerable local lesion and destroyed tissue that the tetanus bacillus finds conditions favorable for its growth.

According to published reports, the incubation period of tetanus seems to vary from a few hours to a month or more, the great majority of cases occurring in from seven to ten days. It is difficult to explain cases which occur in less than the usual incubation period, it being difficult to understand under what circumstances the microörganism finds conditions favorable for such very rapid growth and development. It is much easier to explain why the incubation period can be delayed, it being apparently necessary for other microörganisms to prepare the way and break down the barriers impeding the development of the tetanus organism. It may be impossible to explain those cases which are very greatly delayed, unless we admit them to be secondary infections in which the tetanus organism reached the wound some time after it had been made.

There can be no doubt that the tetanus organism shares those peculiarities of microörganisms in general as regards virulence, vegetative activity, and ability to accommodate itself to its surroundings. Some of the cases into which the true tetanus bacillus enters may not pass beyond the stage of muscular excitability, and trismus may be so slight as to escape report to the physician; other cases may show decided trismus and muscular rigidity, but not reach the stage of tonic spasm or opisthotonus; still other cases will show distinct spasms and opisthotonus and yet recover. The majority of cases pass through all of these stages and die.

The susceptibility of the individual to the tetanus organism is no doubt also variable, but we have at the present time very little data regarding the individual susceptibility of animals, and in healthy lower animals—guinea-pigs, etc.—the laws of susceptibility seem to be about the same. It is therefore probable that it is variation of the bacillus rather than peculiarity of the individual that determines that some cases of tetanus shall recover, though the majority must die.

Local conditions in the wound naturally have considerable to do with the progress of tetanus; thus, if these conditions, usually favorable to the growth of the tetanus bacillus, shall disappear—as, for example, if the surgeon shall excise the entire injured area or shall amputate the injured member—it is very evident that the growth of the tetanus bacillus is checked or that with the excised tissue the organisms may be removed. If no such artificial eradication takes place, it is still possible that the biological conditions in the wound may be altered. The injured tissues, upon which the tetanus bacillus originally fed, may recover and oxygen may be brought to them by reactive hyperemia, thus determining that the tetanus bacillus shall cease its growth; or, it may be, that some organism accompanying the tetanus bacillus, by its metabolic products, occasions its destruction.

These facts surely teach that attention to any wound likely to be infected by the tetanus microörganism is of the utmost importance, and that too great care cannot be exercised in the removal of infected tissues. The most important fact in the natural history of tetanus is, however, yet to be pointed out, and this is that the absorption of the tetanus toxin is followed by so intense an action upon the nervous system that the extremely powerful poison need be present only in very minute quantities to lead to fatal results. It is also true that, in many cases, so soon as the first symptoms of tetanus develop, enough of the poison has been absorbed to cause

death. This is well illustrated by experiments which Nocard made upon sheep's tails. Experimenting upon a number of sheep, Nocard infected the tails with tetanus cultures, amputating the tails at varying intervals of time. He found that if he failed to amputate the tail prior to the earliest manifestations of the tetanus, subsequent amputation of the member failed to prevent death, so much toxin being already contained in the blood at the time of the first manifestations that it is unnecessary that more should be absorbed to bring about death. This clearly shows the danger of delay in the treatment of suspected tetanus infection. To wait until the first symptoms present themselves may be to wait until the case is hopeless; therefore the surgeon should always anticipate the development of the symptoms.

The treatment of tetanus is very uncertain. It is in fact quite doubtful how much is accomplished by any line of treatment thus far suggested, although Moschkowitz in his analysis of cases concludes that the administration of tetanus antitoxin has reduced the death-rate of traumatic tetanus from 90 to 40 per cent. While it may be true that no method of treatment has given satisfactory results in tetanus, it seems to be equally true that the antitoxic serum—*antitetanic serum*—is a thoroughly satisfactory prophylactic, and in the absence of any criteria by which we can determine whether tetanus infection has occurred in a wound, and tetanus will develop in the patient; in our inability to stay the course of the disease after its manifestations have appeared, or to modify the course of the disease when once it is under way, the proper inference would be that in all cases where tetanus infection is to be apprehended, antitetanic serum should be made use of for prophylaxis. It would very naturally be impossible to estimate how much good could be thus accomplished inasmuch as it is impossible to determine that tetanus is about to develop, it is impossible to determine that tetanus has been prevented, and it could only be by comparative results upon a large number of cases that any conclusions could be drawn.

In comparative medicine, however, we find a demonstration of the results of the course of treatment recommended; thus in a series of more than 800 horses suffering from manipulations of such a character that nearly *ten per cent* originally died from tetanus, it was found by McFarland and Ranck that in the same place the same manipulations were followed by tetanus in only *one per cent after the systematic employment of antitetanic serum as a prophylactic measure had been instituted.* Such facts as these speak eloquently for the prophylactic use of the serum.

EDITORIAL COMMENT.

MEDICAL RESEARCH WORK IN AMERICA.

It has been the reproach of the American medical profession that comparatively little has been done in the way of research work. This opprobrium is being rapidly removed, and we can refer with just pride to the brilliant results achieved at Johns Hopkins, Rush, Harvard, and other centers of medical learning. That this backwardness in medical research work is but a part of the conditions which discourage scientific work in America, those who take a broad view of the subject will readily admit. By some it has been held that our medical schools, together with the selfish aims of their founders, the want of preliminary education of the students of medicine, and other factors, are principally responsible, but the truth of the matter is that these causes are more or less sporadic and evanescent.

A recent article from the pen of Simon Newcomb, in the *North American Review* for February, 1902, in discussing the discouragement of scientific work in America, covers the ground accurately in its relation to medical research. He starts out with the admission that the great generalizations of science during our time are of European origin, the best forms of research requiring the right atmosphere for their growth. The most important ingredient of this is an intelligent public opinion. The supposed backwoods state of our civilization, and the fact that we are a republic, as causes are negatived, and Mr. Bryce is quoted: "To ascribe deficiencies, such as they are, of art and culture in America solely or even mainly to our form of government is not less absurd than to ascribe, as many Americans of what I may call the trumpeting school do, our marvelous material progress to the same cause."

There is on the part of the American public a high appreciation of learning. At the same time there is a very imperfect idea of the true spirit of science. It is our failure to estimate the individual side of the investigator that we stand so far behind other enlightened nations. As an illustration of this the careers of Henry and Faraday may be taken as typical examples. The latter was honored in a great center of the world's learning, commanding every facility that the wealth of scientific London could give, stimulated by the appreciation of a great and influential society, and receiving so liberal a support that he had no need to think of the future. Henry was a plain professor commanding no apparatus, and only the

meager salary of our traditional college, placed in a community which had a regard for what he was doing, but no conception of its value. Similar comparisons could be made in the careers of leading American and foreign scientists.

No more striking comparison could be drawn than that between the position of the Royal Society of London, the Institute of France, and our own National Academy of Sciences. The latter, chartered in the midst of the Civil War, has no home, and is entirely out of touch with government. The value of such institutions is thoroughly appreciated abroad, as is attested by the magnificent provision made for their maintenance. Our National Academy of Sciences has been of signal service in two instances: it formulated the regulations dealing with forests on our public domain, a problem which had been grappled with in vain by the Interior and Agricultural departments; founded the Geological Survey, which replaced several competing independent organizations, which were duplicating each other's work at public expense.

In return for these valuable services Congress did absolutely nothing for the Academy; it had no local habitation and must pay its own expenses, clerical and otherwise, by the contributions of its members. Instead of the National Academy increasing in influence, it seems to have disappeared from public view. The founders of the Academy believed that the spectacle of able scientific investigators giving their services without reward would act as an inspiring example. This only shows how slight was the knowledge of the world possessed by these men. Congress measures the value of services lying out of their usual range by their cost. When one works for nothing, the value placed upon his services is naturally zero.

In foreign countries men of letters and science are brought much in contact with government. Politics and learning abroad go hand in hand. They meet at the clubs, and party leaders are present at the gatherings of scientific men. It is this want of touch between the academic and political class that is so abnormal in our civilization. It has been believed that this backward condition as a learned nation would rapidly close up with the advance of intelligence. The trend of events is in an opposite direction. Washington and Jefferson took pride in being personally acquainted with such of their countrymen as claimed a position in the world of learning. In the forties a National Institute for the promotion of science was organized in Washington, which numbered among its members some of the leading politicians of the time.

Politics has become an opprobrium; gradually one occupation after another abandoned the political field to those who make a livelihood in the traffic of public office. The last to go was the lawyer, and while a large number of the governing class are still credited to the legal profession, it is doubtful if they properly belong there, having merely gained an entrance into the ranks of lawyers for the purpose of furthering their political ambitions. How to reduce this dislocation of learning and politics is the pressing problem in our government. It is also one which will solve the problem of scientific and medical research work in America. The establishment of the magnificent Carnegie Institution at Washington would appear to be a long step in the right direction.

THE STARVATION TREATMENT OF APPENDICITIS.

A recent article from the pen of J. H. Carstens (*Chicago Medical Recorder*, January, 1902) brings to the front the starvation treatment of appendicitis. He says that for a long time he has wavered between a conservative, or rather medical, treatment of many cases of appendicitis and operation in all cases. He has finally come to the conclusion that the latter is the only safe method. He reports two cases in which starvation had been employed and two lives were lost, because, as he thinks, operation was not early enough. In addition, he adds certain statistics. The reports include 213 cases of appendicitis; of these, 160 were operated upon during the acute stage or during the interval. Of these, fourteen patients died, the death-rate being 8 per cent. He obtained from the same physicians an account of fifty-seven cases without operation, in which there were eleven deaths, giving a mortality of 20 per cent. He says that the notion that some cases are too late for early operation and too early for late operation is false. It is against common sense, and no case can be too early and hardly any too late for operation.

The question is not to be settled by statistics as defective as those offered by Dr. Carstens, but his opinions and views are worthy of consideration. That immediate operation, as recommended by Dr. Carstens, should be the rule, if it were uniformly accepted by surgeons, we should have to admit, but such is not the case. That there are cases too early for late operation and too late for early operation is believed and acted upon by some of the leading surgeons in this country; hence it has a standing in the literature, and the mere *ex cathedra* utterances of a surgeon of whatever eminence will not dispose of it.

The pathology of the inflammations of the appendix and the

ileocæcal region has been carefully studied of late years, and their relation to general inflammation of the peritoneal cavity is well understood. There are a large number of facts which are practically accepted by the profession, but there are still a few upon which we need more light. Among these is the contention made by Dr. Carstens as to whether every case of appendicitis should be operated upon as soon as it is seen, or whether temporizing may not give better results. It seems to be generally accepted that immediate operation—that is, within the first twenty-four hours after the onset of the disease—gives the best results, as evidenced by a trifling mortality, and there is little danger of infecting the wound, and hence slight danger of hernia. The same favorable results as to mortality and wound healing are obtained in the so-called interval operation. The question presented by Dr. Carstens, one which has been extensively discussed of late years, as to whether greatest good to a greater number can be obtained from temporizing with an acute case and so gaining the favorable conditions which obtain in the interval operation, or by operating immediately, would seem a splendid subject for a collective investigation. If one of the larger medical societies would collectively study their cases of appendicitis with reference to this point, valuable data would be obtained for its solution. As the problem now stands, a physician is justified in taking either course.

THE NATURAL BONE-SETTER.

By the term natural bone-setter was understood in the early part of the last century—indeed, the species is not extinct at the present time—those who had an inborn capacity to treat dislocations. The osteopaths are natural descendants of these early craftsmen. The writer has seen but one natural bone-setter operate. One of his patients suffering from an ancient intracapsular fracture of the hip with non-union, informed him that a bone-setter had been employed to reduce the dislocation. The operation was set for the morrow, and the writer, desirous of witnessing it, attended. With the patient lying upon a couch, the bone-setter grasped the limb, made several movements with it and a number of passes; then rotating the leg violently while in strong flexion, and causing the patient to scream with pain, he suddenly lifted upon the member; there was a snapping sound, and he announced triumphantly that the bone had been replaced. After a few moments the patient was instructed to get up and walk, which she did, claiming to be much improved, and her husband pronounced authoritatively that she walked with less limp

than she did before the treatment. The following day she had a severe inflammation of the hip, which confined her to the bed. For a time afterward the patient insisted that she had been greatly improved by the replacing of the bone, though the neighbors and friends were unable to see that she walked any better than she did before the manipulation.

It would be idle to say that the ancient bone-setter never achieved a success. When rest was the only remedy recommended by the profession, in inflammations of joints, the opportunity for the bone-setter to break up adhesions, and by this means to "replace" a dislocated bone, occasionally presented itself. The snapping sound, which in the operation observed by the writer did not originate in the anatomy of the patient, was one of the artful contrivances for impressing the vulgar. We understand that some of the osteopaths have similar skill, frequently pressing upon the seventh cervical vertebra and having it slip back into place with an audible snap. We do not know just how this noise is produced, but it is evidently one of the hereditary acquirements of the bone-setter.

David Rorie, in the *Caledonian Medical Journal* for January, 1902, has an interesting article on the Scottish bone-setter, who seems to have been as numerous as his Yankee prototype. The Scotch bone-setter was usually a blacksmith. Just why this is so cannot be determined, as Vulcan was notoriously unsound in one of his lower limbs, and did not thereby gain a reputation as being "skeely wi' banes." The victims of these early osteopaths believed that a medical man might study anatomy and surgery for years, and be a fair success as a pill-giver, but "ken naethin aboot banes." A number of cases are cited in which tubercular and suppurating joints were irremediably injured by the manipulations of these self-constituted practitioners. Occasionally the results were not so serious, as in the case of a little Fife boy who had been taken by his parents to a bone doctor for a "sair leg." After much head-shaking and condemnation of the medical attendant several bones were put in and the child brought home. A kindly neighbor inquired if he had suffered much pain. "No fear," said the wee chap, "dae ye think I was sic a saftie as to gie him the sair leg?"

On one occasion two drouthy cronies were swaying homewards, when one said to the other, "Lie doon, Jock! here's the bane doctor. Sham that ye've gotten a bane oot." Down with great ease sank Jock, and the "skeely" one gave his aid with such right good-will that the practical joker was left on the pavement with a very genuine dislocation of the hip.

That the Scottish bone-setter, like his Yankee brother, was not

altogether devoid of success is admitted by the writer when he says that a rough-and-ready massage plays an important part in their treatment, as well as the implicit faith of the patient. "The fearlessness of utter ignorance leads them to deal with adhesions in joints in the most thoroughgoing fashion, and we hear of their successes, not their failures. Many of them have the gift of making a cracking noise at the thumb or finger joints by flexion and extension. When the injury is shown for treatment, the bonesetter handles it freely, says how many bones are 'out,' and then works away at the joint, making cracking noises with his own fingers, each separate noise representing one of the patient's bones returning to its proper position. 'They maun hae been oot, I heard them gaun in.' Seeing may be believing, but hearing 'cowes a'.'"

THE PSYCHOLOGY OF RAILROAD ACCIDENTS.

The recent accident in the Park Avenue Tunnel, New York, in which fifteen were killed and a number injured, again reminds us of the causes of such accidents. It was a rear-end collision. A train, having stopped, was overtaken by one which was following; the engineer, realizing that he was late, was trying to make up time. In a later account he claimed that he was unable to see the signals because of their low situation and the fact that smoke was near the ground. He says: "Before I knew it, we were at 58th Street, where I saw the red signal, and I immediately put on the brakes, but I was too late. But they can talk all they please about precautionary signals and danger signals and all other kinds of signals, but where a man is late, he's got to make up time. I was four minutes late, and it was up to me to make that up."

It is evident that the idea of the engineer in stating that he mistook the signals because they could not be plainly seen was an afterthought. The mental conception that he had was that he was late, and he was acting upon it, and for some reason or other neither the signals, the suggestion of the fireman, nor the efforts of the signalman to stop the train seemed to make any impression upon his mind. His mind failed to work; the signals were correctly seen and interpreted by the fireman, and he called the engineer's attention to them, but still the engineer would not stop the train. A signalman from the train which was struck had gone back a sufficient distance with two red lights. This failing to attract the attention of the engineer of the approaching train, a torpedo was exploded, which in the narrow confines of the tunnel could be heard for a half-mile.

In addition, as the train passed him,. he threw the lantern against the cab of the engine.

It will be seen from the foregoing that every avenue to this engineer's brain seemed to be closed; he was simply an automaton. He certainly could not have been unconscious, for he was apparently able to see, but he was really psychologically blind and deaf. Either it was a case of psychical blindness and deafness, or the suddenness and imminence of the danger may have paralyzed the will of the individual in the same way that a person may stand in front of an approaching locomotive and be utterly unable to get out of the way —a sort of psychical paralysis.

For the protection of trains in this tunnel, every reasonable device seems to have been employed. There were automatic signals that could not be wrongly set, and in addition the train was protected by a signalman sent to the rear; but through none of these means could the attention of the engineer be attracted. The improvements in operating railroads of late years have contained numerous safety appliances, which have greatly increased the safety of travel. There is one item which cannot be improved, namely, the human mechanism. To stop a train upon signal necessitates that the engineer should have an eye capable of correct vision, that the perceptive apparatus of the brain should be active, that there should be a sufficient association in consciousness to act upon the motor apparatus and to bring the train to a standstill. If this chain is interrupted or fails to act, a disaster results. Every precaution may be taken to obtain men who are temperate and skilful, they may be properly cared for as to hours of work and sleep, and may go on operating trains for years without a failure, but some time the nervous mechanism fails, and then there is an accident. The individual may be censured or even punished for what is regarded as criminal carelessness, but he is as much at a loss to account for the accident as others. He simply doesn't know why he acted as he did under a given set of circumstances.

There are very few of us who have not had experiences in which a given action was taken, contrary to the most ordinary rules of prudence and contrary to our usual habit, under like circumstances. We are simply unable to account for them, and they usually make no deep impression on our mind, as they are rarely fraught with serious consequences. Nevertheless, psychologically they have the same basis as those which are accompanied by grave results. Absolute safety can only be assured by substituting mechanical devices for the human mechanism; so far as volition can be eliminated from railway operation, in so far is security enhanced.

ABSTRACTS.

MEDICINE.

A Case of Spinal Tumor — OPPENHEIM, H. *Berliner Klinische Wochenschrift*, 39th year, No. 2, Jan. 13, 1902.

The patient was a strong man 30 years of age, who for two and a half years had pain in the region supplied by the eighth and ninth dorsal roots. The trunk was held stiffly and slightly to the left.

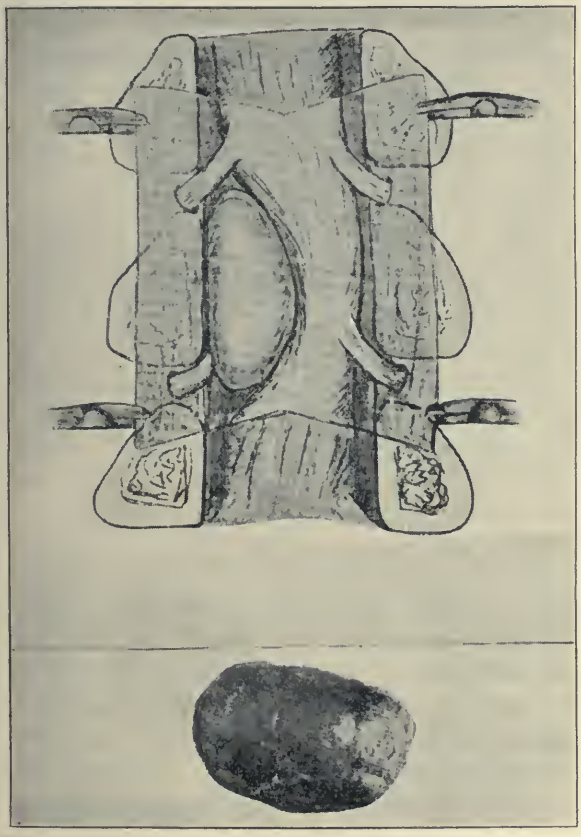

FIG. 1.—Schematic representation of the tumor in relation to the spinal canal and cords.

FIG. 2.—Tumor, natural size.

Pressure and percussion on the fourth and fifth dorsal spines showed tenderness. The umbilicus was drawn somewhat to the right, the abdominal muscles being relaxed. The electric examination was difficult, owing to the fat covering the abdominal walls, but there appeared to be a distinct weakness of the left abdominal muscles.

The abdominal reflex on the left side was lost, while that on the right remained. There was no disturbance of sensation, either of the trunk or lower extremities. The motor reactions in the lower extremities were normal. A probable diagnosis of tumor in the spinal canal was made upon the presence of an intercostal neuralgia of increasing intensity, the failure of the abdominal reflexes, and the atrophic paralysis of the left abdominal muscles. The possibility of a spondylitis was considered, and for a time the patient was kept in a corset. This resulted in no improvement, but, on the contrary, the symptoms were all increased. This was thought to confirm the diagnosis of tumor, especially after extension of the spine increased

FIG. 3.—Condition of cord in region compressed. (Marchi's stain.)

the compression symptoms. Later a paraplegia developed, in which the left side was the most involved. The knee-jerks, especially upon the left side, were increased, where there was foot clonus, and Babinski's sign was marked. At this time a tenderness and swelling was found in the neighborhood of the seventh and eighth ribs.

The fifth and seventh dorsal laminæ were removed, and when the dura was opened a round tumor 3.5 centimeters in diameter presented. Upon microscopic examination it was found to be a myxolipoma. For some days after the operation the patient improved, but later there was fever, pain, and weakness, the patient being very somnolent. Eighteen days later the patient died.

The post-mortem examination showed an ascending degeneration of the posterior columns.

Angina Pectoris.—Robinson, Beverly. *American Journal of the Medical Sciences*, vol. cxxiii, No. 2, p. 225, February, 1902.

Angina pectoris in its typical form is a rare disease. Pseudo-angina, or cardiac asthenia as it is frequently called, is much more common. It is erroneous to speak of angina pectoris as a neurosis of the heart, as in the great majority of instances there are organic changes in the coronary circulation, the cardiac muscle, or lesions of the aortic orifice. Neurotic angina is exceptional, is almost always associated with spasm, or with a sudden increase in intracardiac pressure.

As a rule pain does not characterize organic heart disease as commonly met with. There may be precordial anxiety, oppression, or reflected pain, but acute cardiac pain usually indicates other conditions than organic disease. In true angina the pain is characteristic, and ordinarily points to organic changes in the heart's structure. It is marked by intensity, the patient standing immovable when the attack occurs, or he grasps surrounding objects and presses his hand to his heart until it subsides. During the attack the muscles of respiration are almost immovable. This serves at once to distinguish true angina pectoris from cardiac spasm, in which the respiratory efforts are forcible. The pain in angina is not always the same; sometimes it is located over the precordial region, occasionally in the upper portion of the chest, and in a few instances it may be across the chest at the level of the xiphoid cartilage. The pain is compared to a heavy weight or crushing pressure. In some cases the pain radiates toward the left arm, and it may begin in the left wrist.

Cardiac hypertrophy or dilatation frequently accompanies this disorder, but many cases presenting these symptoms have no pain whatever. Even in acute cardiac dilatation no intense pain is felt. In angina the patient is usually pale and of a gray, ashen hue; there is great weakness and the pulse is usually feeble and irregular. Occasionally, the pulse seems to be unaltered. Sometimes the attack of angina terminates by a sudden explosion of gas from the stomach; hence it has been stated that flatulent dyspepsia is an efficient cause of true angina. It is possible that the dyspeptic symptoms may depend upon the cardiac disturbance.

The duration of an attack is variable, from a few seconds to several minutes. It is probable that the prolonged attacks which have been described are really cases of neurasthenia or hysteria. Abortive attacks occur, due to the fact that the patient in his previous experience has learned the necessity of remaining motionless,

and the pain does not reach its full development. Anginoid attacks without pain may suddenly terminate the life of a paient in syncope. It may be that the attacks were originally painful and lost this characteristic feature. In such cases, upon autopsy, fatty degeneration of the heart walls will be found, or advanced aortic disease. When the coronary circulation is obstructed by embolus, a breast-pang seems to be almost invariable. That attacks occur so frequently during sleep is due to the tendency of accumulation of flatus, which accompanies the prone position; the circulation being less active in repose. The influence of cold in the production of the attacks is evident. This is particularly true when a patient is walking against a cold wind.

Angina is almost unknown in the progress of mitral disease, but it is common in aortic disorder, the symptoms of the latter only appearing late in the disease. Fibrous myocarditis and arterial degeneration are frequent findings. Fatty degeneration of the heart-cells often exists. Occasionally associated with more or less advanced changes in the coronary arteries, the peculiar appearance of fibrous myocarditis is noted. In all instances in which there is organic lesion of the heart the term angina should not be employed. It should be restricted to those cases in which no discoverable lesion is found upon autopsy.

The prognosis of true angina is uncertain. We are to be guided by the symptoms associated with degeneration of the heart wall, or other vascular changes. If the disorder is associated with high arterial tension or the aortic second sound is marked, proper treatment may do much to modify the condition. For this purpose nitroglycerin and the nitrites are valuable. The patient should not walk after a meal, nor should he under any circumstances walk hurriedly. The general health should be given due attention. The nitrites, from the prompt relief they afford, may be injudiciously used by the patient. The nitrite of amyl is frequently more useful than nitroglycerin. In those cases in which the heart is weak, the nitrites may not relieve the pain, and in these cases the old stimulating treatment, such as mustard plaster or a hot-water bottle, may be employed. In cases in which there is marked heart failure, ether or brandy hypodermically is useful. Oxygen inhalations are often useful. Strophanthus and digitalis are of little or no service. Rest in bed a short time is desirable after an acute paroxysm, but an effort should be made to get the patient back to his old life with judicious restrictions. Physical therapy is useful in some cases, but it must be utilized with care.

Tinnitus Aurium.—KERRISON, PHILIP D. *Laryngoscope*, vol. ii, No. 6, p. 440, December, 1901.

This annoying and persistent symptom is dependent upon a variety of conditions. In the experience of many otologists, nearly as many patients apply for treatment for this condition as for impaired hearing. The relief of deafness is often easier than the abatement of subjective noises. A classification of the symptoms should relate to the underlying conditions, but this is impossible. The following may be regarded as a convenient provisional arrangement:

1. Conduction sounds or noises due to occlusion or impaired mobility of some portion of the sound-conducting apparatus.

2. Blood sounds or noises produced by the blood-current in vessels in or near the ear, and due either to disturbance of the local or general circulation, and to abnormalities in the size, shape, or position of the vessels.

3. Labyrinthine sounds or noises due to alterations in the pressure within the labyrinth.

4. Neurotic sounds or noises due to increased irritability of the auditory nerve.

5. Cerebral sounds or noises due to lesions of the auditory centers in the cerebral cortex.

In the search for these various causes, evidences of disease in any portion of the conducting apparatus should be carefully looked for by a thorough physical examination. The history of the case should be obtained and an accurate description taken of the character of the sound. A careful functional examination should be made, and diseases of other organs or the digestive tract, or circulatory disturbance, should be looked for. In addition, the effects of certain drugs in relieving or aggravating the tinnitus should be noted.

A physical examination of the ear is never to be omitted, because any lesion of the conducting apparatus is an important contributing factor to the production of tinnitus. From the patient we can learn the character of the noises, whether unilateral or bilateral, simple or elaborated, constant or intermittent, pulsating or uniform, and the pitch. The latter is of importance, for, generally speaking, low sounds suggest tympanic and high sounds labyrinthine involvement. The pitch is best determined by holding a tuning-fork, 256 D. V., opposite the patient's ear and requiring him to decide whether the pitch of the subjective sound is higher or lower than that of the fork.

The length of time during which tinnitus persists is of some

importance, as sounds of tympanic origin rarely persist for a great length of time. The subjective noise persisting constantly from childhood to adult life suggests an anomalous position of the vessels. Elevation of the lower tone limit suggests tympanic disease, while the lowering of the upper tone limit points to labyrinthine disturbance.

Treatment of Pulmonary Tuberculosis Outside of Closed Sanatoria.—MINOR, C. L. *New York Medical Journal*, vol. lxxv, No. 2, p. 49, Jan. 1, 1902. (Concluded from vol. lxxiv, p. 1145.)

The writer concludes what is one of the best of the recent articles on the treatment of tuberculosis outside of special sanatoria, with certain specific directions which are vital in the successful management of these cases. It is apparent that such specific details can only be carried out in a class of patients having some intelligence and surroundings that admit of a certain degree of comfort. Given these factors, it is possible by the application of the specific directions which he gives to successfully manage most cases of the disease. Among the explicit directions is the keeping of an accurate record by the patient. Such a record has a page for each day, and is similar to a nurse's record, with parallel columns for the hour, pulse, temperature, and food. In addition, the patient is to record his periods of rest and the amount of exercise, expectoration, spirits, appetite, and digestion. The treatment is begun with a rest of two weeks, the temperature being taken at intervals of two hours. Usually the first week determines how much exercise the patient can take. As a rule a trained nurse is not necessary, providing a reliable servant is at hand to attend to the wants of the patient. Certain necessary adjuncts, such as a proper reclining chair, which should be so constructed as to admit of a perfectly horizontal position, should be provided. With such a chair the patient can be kept in the open air, even when there is considerable fever. As a rule, blankets are not sufficient when the patient is out-of-doors; a steamer rug sewn into the form of a bag is the best protection. When patients are upright, a couple of bricks in a wooden box at the feet, and for those who recline a hot-water bag, are useful. The patient should be provided with wool underclothing. Sputum cups made of paper, which can be burned, are preferred. A satisfactory hydrotherapy can be carried out by a small bath tub, a thermometer, and rough towels. Patients, where an accurate record is kept, need not be seen oftener than three or four times a week, and in some cases where intelligent coöperation is possible, even less

frequently. The adaptation of the amount of exercise to the case is one of the most difficult problems. It is to be largely governed by the body temperature. It had best begin with massage, and when this is not followed by a marked rise of temperature, the patient may take a short stroll on level ground. As a rule, driving is more tiresome than walking. Pulmonary gymnastics are useful after the acute process has subsided. Suitable amusements and absence of worry, and, above all, that hardening of a patient's body which comes from a constant outdoor life, and hydrotherapeutics, are most important in the management. The length of time needed for a cure varies in different patients, but we should always be cautious in applying the term "cured"—we should rather say "process arrested," as a final note in most cases.

Uncinariosis (Ankylostomiasis).—CLAYTON, THOMAS A. *American Journal of the Medical Sciences*, vol. cxxiii, No. 1, p. 28, January, 1902.

The writer is of the opinion that this disease is more prevalent in the United States than is commonly believed. The majority of the cases so far reported in this country have all been placed upon record in the last few months. He believes that it is common among native Americans. Of the twelve cases so far reported, five probably had their origin in the United States, and three brought the infection from abroad. It is the opinion of A. J. Smith, of the University of Texas, that the disease is quite common in Texas, as he found the ova of the worm in the evacuations of eight out of eighty-eight students. The majority of these individuals had never been outside the State.

The case reported was in a native of Westmoreland County, Va., aged 18 years, whose undersize and small, childish face suggested a boy of 14. The mentality was much below the average. He had never had any of the diseases of childhood, nor malaria. About three years prior to coming under observation it was noticed that he was pale, and one year later the anemia became more marked, and there was swelling of the face, abdomen, and feet. The chief symptoms were weakness, dyspnea, and pallor. There was no gastro-intestinal disturbance. The expression was anxious and dejected; the skin was of a faint yellow tint. The mucous membranes were extremely pale, the body well nourished, but the muscles flabby. The heart's impulse was diffuse. The urine was clear and acid, with a specific gravity of 1010. The lowest blood-count was noted June 4, when the red cells had fallen to 1,450,000 and the leucocytes to 4400, the hemoglobin to 30 per cent. During the early treatment

of the case an attempt was made to count all the worms that were passed, but this was abandoned, as the number had run up to 407 and the supply seemed inexhaustible, in spite of the weekly administration of thymol in two doses of thirty grains each. The ova were looked for each week and gradually decreased up to the time of the patient's death, which was caused by cerebral hemorrhage two months after admission, but had never entirely disappeared. The general condition had improved, but there was always fever, the temperature ranging between 99° and 100°.

Auscultation of the Knee-joint.—BLODGETT, W. E. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 3, p. 63, Jan. 16, 1902.

This preliminary report is based upon an auscultation of about one hundred cases, and while necessarily its conclusions are tentative, they point to what may prove a decided advance in the symptomatology of joint affections.

So far auscultation has been confined almost exclusively to the knee-joint, but in one case of supposed complete ankylosis of the hip, detection of joint sound excluded firm bony union. A full-sized Bowles stethoscope with a soft-rubber cap sprung over the end is used. The patient may be lying down or sitting on the edge of a chair. The examiner, kneeling or sitting at the side, grasps the leg with the hand that is nearest the foot, and with the other holds the thigh just above the knee, while the receiver of the stethoscope is placed on the bare skin over the patella. As the knee is extended, the thigh is allowed to sink, all active movement on the part of the patient being so far as possible excluded. If the skin is hairy over the part to be examined, it should be covered with vaselin, as this prevents the hair from slipping under the stethoscope, which causes a high-pitched, cracking noise. The examination begins with the knee in full flexion, extending and flexing the joint several times. By an ingenious combination of dots and dashes the writer records the sounds heard, beginning with extension after the leg is in flexion, carrying it outward and again back to full flexion. Excluding adventitious sounds, the commoner noises heard in a normal knee-joint may be spoken of as snapping, creaking, and squeaking. The first and second sounds are similar; the third is unmistakably different. The first sound is represented by round dots, the second and rougher sound by short, vertical parallel marks, and the third by short dashes. Intensity of the sound is recorded by the size of the mark and their frequency, roughly indicated by the number.

In concluding the article, it is recognized that the observations so far made are too few to justify definite conclusions, but the method seems to have sufficient value to warrant further investigation.

A New Method of Sedimenting the Sputum.—QUENSEL, ULRIK. *Nordiskt Medicinskt Arkiv*, Bd. 34, No. 22, p. 19, 1901.

The sputum is placed in a flask having a capacity of from 200 to 300 cubic centimeters, and a fluid composed of one volume of 25-per-cent formalin and one volume of 95-per-cent alcohol is added. The mixture is then shaken, there being formed a thin emulsion, which is allowed to subside in a conical glass, or it may be centrifugalized. A small portion of the precipitate is taken upon an object glass, where it is spread out and allowed to dry in the air, when it is stained in the usual way. Ziehl's carbol-fuchsin method does not give the best results, as the spreads are with difficulty decolorized. The best preparations are made with the gentian violet and anilin water, being decolorized in nitric acid in alcohol. Vesuvin may be used for a contrast stain.

SURGERY.

Hepatectomy.—MCKAY, W. J. S. *Australasian Medical Gazette*, vol. xxi, No. 1, p. 15, Jan. 20, 1902.

A woman 36 years of age had a tumor situated to the left of the median line, in the epigastric region. Its lower border was well defined, extending as low as the umbilicus. There was a distinct tympanitic zone between the liver and the tumor, which led to the suspicion that it might be connected with the transverse colon. A median incision was made, which showed the peritoneum everywhere united with the tumor. After the adhesions were freed, the growth was found to have a diameter of about eight inches, and to involve the left lobe of the liver. There was no pedicle. The tumor was delivered through the abdominal incision, and silk ligatures were passed through the liver behind the growth. When these ligatures were tightened they cut through the liver substance. The involved portion of the liver was transfixed with hat-pins and ligated with silk, the strands being passed through the abdominal wall and tied. In this way the tumor was firmly anchored. There was considerable pain following the operation, due to the dislocation of the liver. On the third day about half of the tumor was cut away. This was fol-

lowed by considerable oozing, which was checked by the cautery. Each day after this a slice was removed, and by the seventh day the pins which had been used to transfix the liver were nearly reached. The incision through the liver substance gave the patient no pain.

The growth was found to be a sarcoma. For a period of three years after the operation the patient was fairly well, but of late the liver has begun to enlarge, which leads to the belief that there has been a recurrence.

The operation of partial hepatectomy has been performed fifty-five times. The number would be increased by twenty if there were included cases of hydatid cysts, in which an amputation of a portion of the liver was made. These cases may be divided into four groups:

1. Where the tumor is brought out through the abdominal incision, fixed externally by pins, and constricted by an elastic ligature. The tumor is removed by amputation, or by the cautery.

2. Where the tumor is removed at the time of the operation, the surgeon controlling the hemorrhage by temporary elastic ligature, and then fixing the stump by attaching it to the edges of the abdominal wound.

3. Where the tumor has been removed by slowly cutting through the liver substance with the cautery, enucleating the tumor with the finger-nail or a curette, or by removing a wedge-shaped piece, hemorrhage being controlled by ligating the vessels and packing.

4. Cases in which the tumor has a pedicle containing sufficient fibrous tissue to enable the surgeon to separate the tumor and drop the pedicle, closing the abdominal wound.

Partial hepatectomy is an infrequent operation because of the difficulty of controlling hemorrhage. Any mass ligature introduced into the liver substance will fail to control hemorrhage if the ligature is inserted in such a way that when it is tightened it tends to form a circle. In an effectual hepatic ligature the strands of the ligature must remain parallel when drawn upon.

The writer has tried various forms of ligature upon portions of the liver, and recommends the use of decalcified bone-plates having a breadth of one-half inch and a length of one inch, in which two holes are bored; they are then threaded with catgut, as shown in Fig. 1. The central loop (C) should be of a different color from the side pieces A and B. The lower free ends, A^1 and B^1, are caught by catch forceps.

In operating for a tumor of the liver the growth is exposed, its limits defined and walled in with gauze sponges. A blunt pedicle

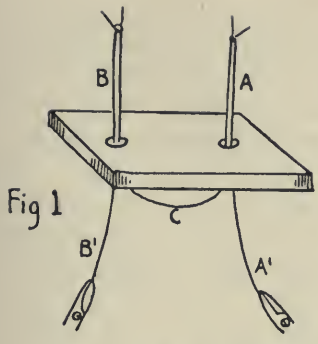

Fig 1

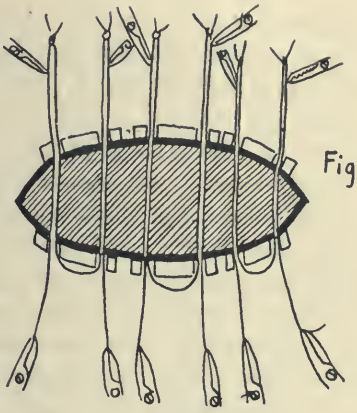
Fig 2

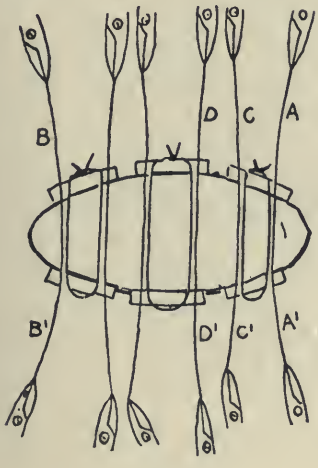

Fig 3

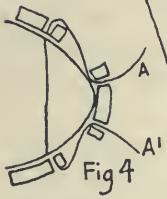

Fig 4

Fig 5.

Fig 6.

needle is then pushed slowly from above through the liver substance, until it emerges below, when it is threaded with one of the loops (A), and the needle is withdrawn, carrying with it the loop to the upper surface of the liver, where it is passed through the plate and caught by a pair of catch-forceps. The uncolored outer strand only should be seized (Fig. 2), so that when all the loops have been drawn up and are about to be tied the colored loop is severed, thus leaving the forceps attached to the uncolored strands and avoiding confusion.

The central colored loops should be tied first, giving a series of fixed points, then the lower strands (Fig. 3, C^1 and D^1) of the uncolored gut are tied, and then the upper portions of the same strands (Fig. 3, C and D); the end strands A and B are left until the last, when they are tied so as to encompass the extremities of

the base, A being tied to A^1. The liver is so readily cut through that it is well to bring both these strands through a small curved plate and then tie them (Fig. 4). A sharp or triangular needle should not be used, as this may wound the large hepatic veins. If a blunt needle is used, it is possible to recognize when the fibrous coat of a large portal vein is encountered.

With the hemorrhage controlled as described, the tumor may be removed either by the cautery or amputation. If the cautery is used, it should be heated to a dull red, so as to char the tissues, and be drawn across the surface repeatedly, a little being burned at a time. The cautery has no power to arrest hemorrhage from a large portal vessel; these should always be tied.

In excising a tumor the incision should be V-shaped, so that the surfaces may be brought together by a few mattress or single sutures (Fig. 5). If the surface left after removing the tumor is a broad one, we should isolate the liver by placing a sheet of iodoform gauze beneath it (Fig. 6), bringing it in contact with the charred surface.

There is no objection to leaving decalcified, sterile plates in the peritoneal cavity, as they are probably less irritating than three or four inches of charred liver surface. These plates may be used for operating cases of rupture of the liver, and may be employed where hydatid cysts are removed that are situated below the surface, and it is necessary to incise the liver substance to remove the cyst.

Phantom Tumors.—BENNETT, W. H. *Lancet*, vol. clxii, No. 1 of vol. i, p. 1, Jan. 4, 1902.

In a lecture delivered at St. George's Hospital, the writer discusses surgical phantoms, or what is commonly known as phantom tumor. Such tumors are the result of muscular contraction, and while it is not in itself a disease, it points to the existence of abnormal conditions. These tumors have uniform characteristics: are hard, resistant, smooth, and in shape conform to a muscle or group of muscles. Over the abdomen they are always resonant, but less so than the surrounding abdominal wall. Sometimes they disappear during sleep, but profound anesthesia always leads to their disappearance. As a rule they are not painful. He divides phantom tumors into four groups: (*a*) caused by irritation of the skin or superficial parts, either immediately over the muscles or the nerves supplying them; (*b*) those due to underlying disease or abnormality, such as an inflammation within the abdomen which leads to a reflex contraction of the muscular wall; (*c*) a group that may be classed among the occupation disorders, due to bringing into action certain

muscles continuously, for a long period of time. Muscular tumors of this class may persist long after the occupation has been changed. (*d*) In certain neurotic individuals, imitation may cause these tumors.

An example of phantom tumor due to irritation was that of a man 34 years old, who had a swelling on the inner aspect of the right thigh, mainly over the adductor muscles. There was a slight injury the year before, which was followed by a "bleb" near the junction of the thigh and the perineum, which burst. Three months after the injury the swelling in the thigh was first noticed. Upon exertion the leg easily became tired, and examination of the right thigh showed an elongated swelling in the course of the adductor longus muscle. It was hard, elastic, and seemed to involve nearly the entire length of the muscle (Fig. 1). There was a peculiar elasticity to the swelling which suggested fluid, and led to the introduction of an aspirating needle, but the examination was negative. It was finally decided to make an exploratory incision, and the usual aseptic dressing was applied. Upon anesthetizing the patient and removing the dressing the tumor was found to have entirely disappeared. After the effects of the anesthetic passed off the tumor returned.

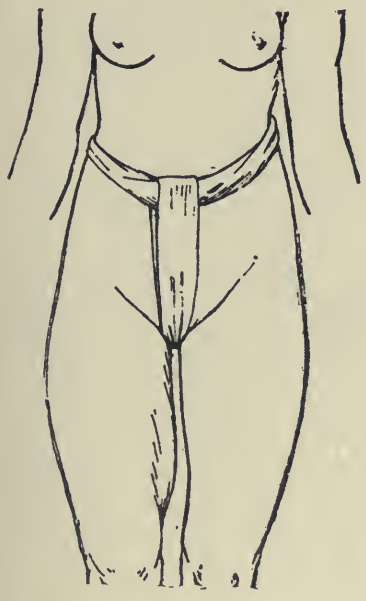

FIG. 1.—Phantom tumor on the inner side of the right thigh caused by the irritation of a small suppurating sebaceous cyst under the groin.

An example of the occupation phantom occurred to a compositor 35 years of age, who two months before his admission had suffered from a severe cough, which he had been told was due to consumption. During the examination attention was called to a tumor above the left clavicle, of the existence of which he had been ignorant (Fig. 2). It so happened that the patient's wife was the subject of carcinoma of the breast, of a most painful kind, and in consequence the patient's thoughts became concentrated upon the tumor, and it soon became painful and steadily increased. Upon examination there was found a tumor in the left subclavian region,

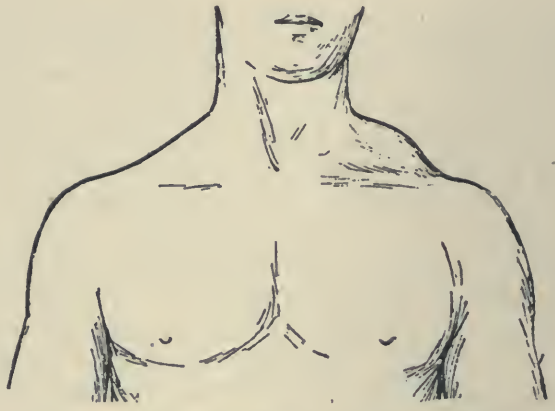

FIG. 2.—Occupation phantom tumor over the left subclavian region in a compositor.

which to the touch was as hard as bone. There was no tenderness, but a constant aching pain was complained of, which at times shot down the arm. It was at first thought that the tumor might be due to an exostosis, but a skiagraph showed no abnormal shadow. In the course of this man's work as a compositor he was in the habit of holding in his left hand a "stick" which held the type. For some time he had become unusually tired about the shoulder while at work; he held the shoulder high because the change in position relieved him temporarily. Some sort of an operation seemed imperative to relieve the patient's mind. When he was anesthetized and the temporary dressings removed, the tumor was found to have entirely disappeared. In this case the tumor evidently resulted from a continual overstrain of certain muscles.

Plastic Operations of the Face.—VAN HOOK, WELLER. *Illinois Medical Journal*, vol. li, new series, vol. iii, No. 9, p. 410, February, 1902.

Two cases are reported illustrating plastic operations of the face, together with suggestions for covering bones that have lost their periosteum.

A woman with sarcoma of the skin of the frontal region presented a tumor one and three-quarter inches in diameter, gradually shading into the surrounding tissues and presenting a circular outline. The growth was widely excised, the periosteum of the frontal bone being removed with the tumor. The defect remaining was about three inches in diameter, extending into the hairy part of the scalp (Fig. 1). To fill this defect, a pedunculated flap about one-third greater in area than the space to be covered was taken from

FIG. 1.—Sarcoma of the forehead. Defect left by operation filled with flap from parietal region.

the parietal region, the flap containing branches of the temporal artery. In raising the flap the periosteum was left undisturbed, together with the aponeurosis. Upon this surface Thiersch grafts taken from the arm were laid down. Healing was rapid. By this method the bare bone is quickly covered with integument. A disadvantage is that the hair is transplanted to the frontal region to grow close down to the eyebrows.

A second principle is in utilizing skin to make good the defect in a mucous membrane. A man suffering from pain in the jaw applied to a cancer quack, who said the disease was malignant and applied pastes to the jaw. The corner of the mouth was partly destroyed, a portion of the jaw eaten away, and a considerable

FIG. 2.—A case in which skin was used to replace mucous membrane in restoring the outline of the mouth.

defect in the cheek produced. In operating upon this case, the skin and muscles were separated from the jaw at a distance of one-half inch from the edge of the defect. In this way a flap was made which could be turned into the mouth, the skin being utilized to take the place of the lost mucous membrane (Fig. 2). The skin of the cheek was sufficiently liberated so that it could be united externally by sutures. The result was excellent; the patient was able to open his mouth widely, and there was no dribbling of saliva.

Operative Intervention in Spinal Fracture.—WALTON, G. L. *Journal of Nervous and Mental Diseases*, vol. xxix, No. 1, p. 1, January, 1902.

The writer leans strongly toward early operation in fractures of the spine which involve the cord. A study of the cases so far

reported justifies the belief that operation should be a common procedure, as by this means we relieve pain and improve the course of the average case; with an occasional patient there may be a cure. There are no symptoms which establish the fact that the cord is irremediably crushed. Many cases have been published, both operative and non-operative, where more or less complete restoration of function has occurred when the initial symptoms indicated a total transverse lesion of the cord. The terms complete and incomplete lesions should not imply that the symptoms of the former are necessarily incapable of amelioration. Early operation is to be employed in all doubtful cases. By it we accomplish all that a late operation would, and it is performed to better advantage in the absence of adhesions and callus. Flaccid paralysis, anesthesia with an abrupt line of demarcation, total loss of reflexes, urinary retention, priapism, and tympanitis, if persistent, point to complete and incurable transverse lesion. Even in the presence of such symptoms in recent fracture a certain degree of restoration of function is possible. The prognosis of all such cases is grave without operation. The results of operation, while not brilliant, are sufficiently encouraging to warrant us in making the practice general. It is usually better to operate within a few days of the injury, but a delay of some hours may be advisable, partly to eliminate shock and to establish the diagnosis. As we have no infallible guide to the extent of the lesion, the operation at the worst does not materially endanger life nor affect unfavorably the course of the case. Instead of selecting the occasional case for operation, we should admit certain contraindications, which are great displacement of vertebræ, with high and rising temperature, and the patient plainly moribund. In the operation the dura should be opened early; it need not be sutured, and drainage is not necessary.

Operative Treatment of Anal Fissure. — GUSSENBAUER, KARL. *Wiener Klinische Wochenschrift*, 15th year, No. 2, Jan. 9, 1902, p. 31.

The writer rejects incision, excision, cauterization, and the subcutaneous division of the sphincter, in the treatment of anal fissure, adhering only to the forcible dilatation recommended by Recamier. He first saw this method employed by Verneuil in 1875, and since then he has used it both in private and hospital practice upon a large number of cases. The operation especially commends itself because of the certainty of results and the short time that the patient is laid up. The incision recommended by Boyer is to be accounted a major surgical operation, when we consider the danger

of infection. The superficial invasion of the sphincter does not prevent the tonic cramp, and the same is true of cauterization. In Recamier's method, not only is the fissure treated, but the spasm of the sphincter is overcome, permitting of a rapid healing of the denuded mucous membrane.

THERAPEUTICS.

Treatment of Gastroptosis.—STEELE, J. D. *Philadelphia Medical Journal*, vol. ix, No. 4, p. 174, Jan. 25, 1902.

A lengthy article upon the displacements of the stomach, together with a discussion of the diagnostic criteria, is concluded by some excellent remarks upon treatment. Tight lacing and heavy clothing hanging from the waist-bands should be forbidden. Clothing should be supported from the shoulders. The patient's habits should be rigidly scrutinized. Rest for at least an hour after meals, flat upon the back with the clothing loosened, is a useful measure. Food should be taken in small quantities and should be digestible and adapted to the gastric secretions. A diet applicable to all cases cannot be given, as the amount of food is dependent upon the amount of hydrochloric acid secreted, and this is largely determined by the presence or absence of dilatation. Two measures are to be insisted upon, namely, that the food shall not be too great at one time, and that there shall be a period of rest after each meal. Lavage is not required unless retention demands it.

The stomach is to be held in place by a belt or abdominal bandage, so as to exert pressure from below upward and backward; the ordinary elastic supporter is best for the purpose. A simple binder is usually not sufficient. The lower edge of the belt must be firmly held against the pubis by perineal bands. If this counter-force is not employed, the belt invariably slips upward, and the satisfactory effects of upward pressure cannot be obtained. Pads are useful in connection with the belt; they should be from three-fourths to one and three-fourths inches in thickness, so placed as to exert upward pressure. Such a pad may be advantageously placed below the displaced pylorus. In total descent it is well to employ two pads parallel to and a little above Poupart's ligament. Without pads it is rarely possible to restore the stomach to its normal position. In cases where the abdominal walls are thin, it is difficult to exert sufficient upward pressure by a belt alone, and in such individuals the pads are indispensable. Any apparatus for retaining the stom-

ach cannot be shown to be satisfactory until the organ is shown by inflation to be in its normal position when the apparatus is in place. The belt should be snugly fitted and worn fairly tight around the hips, while the upper border should be loose. The proper application of such a belt is shown by almost instant relief of the symptoms. Such an apparatus, however, does not produce a cure. It only aids the stomach wall in recovering its tone.

Operative measures in this condition are advised hesitatingly, as it is impossible to state of what value they may be in permanently relieving the condition. Until such time as the indications for operation are more clearly defined than at present, it is wise to restrict the surgical treatment of the condition to those cases in which the symptoms are clearly traceable to peritoneal adhesions, or those which are not amenable to more conservative measures. When the trouble is aggravated by a relaxed pelvic floor this should be remedied, and where there is much separation of the recti, Webster's operation is to be recommended.

Izal in the Treatment of Consumption.—TUNNICLIFFE, F. W. *Lancet*, vol. clxii, No. 3 of vol. i, Jan. 18, 1902, p. 146.

The writer says that fresh air and proper feeding have practically superseded drugs in the treatment of pulmonary tuberculosis, yet the latter may have a place in conjunction with the former. Professor Kobert is quoted approvingly when he says: "The fact that we possess no specific remedy in phthisis is far from the same thing as not possessing any useful drug. We possess no specific climate in phthisis, but many useful ones." Experiments upon the tubercle bacillus with izal show that in appropriate quantities it prevents their development. The toxicity of izal is relatively low. When introduced into the alimentary canal, it can be recovered from the discharges of the bowels, and one of its paths of excretion is the pulmonary mucous membrane. It comes in the form of an oil, the dose of which is ten minims. A common form of administration is to give two to ten minims combined with five minims of cod-liver oil in capsule. The dose should never exceed fifteen minims during the day. One day in four the treatment is omitted. An ordinary lamp equipped with means for vaporizing can be employed in impregnating the air of the sleeping-room with izal vapor. The patients who received this treatment belonged to the better class of out-patients of a London chest hospital. The observations have extended over nearly two years. The patients having evening temperatures of 100.5° were kept in bed or at rest in the open air. In

no case was any form of morphine or expectorant given, or any of the so-called gastric tonics. The patients were instructed to take as much milk and easily digested food as they could.

The writer divides the cases treated into four classes: Those with no tendency to hemorrhage, slight fever, scanty, blood-stained sputum, and slight invasion of the lungs; a second more severe type; a third chronic group; and those in the terminal stage, in whom there was extensive excavation of the lung and a tendency to pneumonia. Summarizing his results in these different cases, he comes to the conclusion that there are certain individual cases of phthisis that render any addition to our therapeutic resources of distinct advantage. Carbonated guaiacol in certain cases is useful, but it is expensive. In izal we have a cheap and efficacious drug, the best results from which are obtained in active pulmonary tuberculosis with abundant fetid expectoration and cavities. It is beneficial in cases in which diarrhea is present, whether this be due to decomposition of intestinal contents or to a tubercular lesion of the intestines. In cases with a marked tendency toward bronchitis little or no benefit is obtained from the drug.

The Carbonate of Creosote in Pneumonia.—Thomson, W. H. *Medical Record*, vol. lxi, No. 5, p. 161, Feb. 1, 1902.

The writer reports eighteen cases of pneumonia, seventeen of which recovered, treated at the Roosevelt Hospital from May to November, 1901. It is stated that the patients formed in no sense a selected class, or represented as to age and previous health conditions different from those of the average pneumonic patient. The results with the drug were more favorable than with any treatment so far employed. In three of the patients both lungs were involved, and all of these cases recovered. As to whether the pneumonia was milder because of the seasonal conditions is not determined, but three of the patients were chronic alcoholics, and one of these had double pneumonia.

The single death occurred in a case of only moderate alcoholic addiction. At first he seemed to be progressing favorably, but the temperature was peristtently elevated and did not seem to be affected by the medication. In one of the cases in which the outcome was favorable the treatment could have had little influence, as crisis occurred within twelve hours after the patient's admission.

That the drug may exert a special effect upon the pneumonia is probable, from the course of the temperature after its administration. In twelve of the cases the disease terminated by lysis, and by

crisis in only five. In a number of cases the temperature fell from one to three degrees in twenty-four hours after beginning the drug. Commonly the following day the temperature would again rise, and have an irregular course for a number of days before it reached normal. Carbonate of creosote, or creosotal, overcomes tympanites, which symptom was pronounced in five of these cases. It is tolerated by the stomach, and its prolonged administration in large doses seems to have no unfavorable effect upon digestion. In pneumonia it is given in 15-grain doses every two hours, night and day, or 180 grains in the twenty-four hours. Even in these large doses it has no depressing effect upon the circulation.

The following is a convenient formula for administration:

Carbonate of creosote	4 drachms.
Glycerin	1 ounce.
Peppermint water	½ pint.

M. Dose: Tablespoonful in water.

Treatment of Ringworm.—JACKSON, G. T. *Medical Record*, vol. lxi, No. 5, p. 164, Feb. 1, 1902.

At the Vanderbilt Clinic, in which a large number of cases of ringworm are treated every year, a preparation composed of one drachm of crystals of iodine to an ounce of goose-grease has proven to be the most effective remedy. It is applied twice a day until it produces a reaction, as shown by a little swelling of the patch; then once a day is sufficient. In two or three weeks the hair falls from the patch, but it grows again, after which the affected area is restored. The first application of the remedy may cause a little pain, but this lasts only a few moments, and even children do not complain. When used upon the bearded portions of the face, the applications are more painful than when the scalp is the part treated. If such reaction occurs, the remedy can be suspended for a day or two, substituting some bland ointment. Many cases of ringworm of the face have been cured in three weeks. The goose-grease is regarded as an essential in the preparation of the ointment, and this is sometimes difficult to obtain, as commercial samples of goose-grease are often made from other fats which have a low melting point.

The Active Principle of the Suprarenal Gland in Genito-urinary Work.—CHASSAIGNAC, C. *New York Medical Journal*, vol. lxxv, No. 7, p. 280, Feb. 15, 1902.

The active principle of suprarenal gland serves a useful purpose in locating the source of blood in hematuria. When in doubt as to whether the bleeding is from the mucous membrane of the bladder

or the kidneys, the injection of adrenalin into the bladder will contract the superficial vessels and stop the bleeding for a time. If the urine is cleared by this procedure for a time, it would show that the hemorrhage is from the bladder. This substance facilitates cystoscopic examination by suppressing the hemorrhage from the membrane of the bladder, thus permitting a free field for the examination of the bladder wall. The drug is useful in diminishing the engorgement of the urethra, thus facilitating the passage of instruments; with it a larger sound can often be passed than is possible without its use. It is valuable in the treatment of the slight mucous discharge which persists after acute urethritis. It contracts the engorged capillaries, and this repeated restores the tone of the mucous membrane and relieves the discharge.

Antidiphtheritic Serum in the Treatment of Sepsis.—PATON, D. M. *Therapeutic Gazette*, vol. xxvi, No. 2, p. 89, Feb. 15, 1902.

Attention is called to the fact that diphtheritic antitoxin was recommended in other diseases than diphtheria about four years ago. It was said to have been given hypodermically for sepsis with success, and to have been successfully given by the mouth in diphtheria. This led the writer to experiment with the oral administration of antitoxin in the treatment of sepsis. In the past four years he has employed this plan extensively, administering not less than eight million units of diphtheria antitoxin. He regards the remedy as a specific in staphylococcic and streptococcic infection. That the specific effect of the serum is obtained when administered by the mouth is shown by the fact that in some of the writer's cases the characteristic skin eruptions followed the oral administration. The dose commonly employed is 750 units given in the morning, this dose being repeated as often as once in six hours in severe cases. For erysipelas, one-half ounce every eight hours is usually effective.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Treatment of Chronic Inversion of the Uterus.—CUSHING, E. W. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 7, p. 163, Feb. 13, 1902.

Of the various methods of treating chronic inversion of the uterus, the writer prefers that of Thomas. In this operation the abdomen is opened, the funnel-shaped depression of the fundus is dilated, and the uterus replaced.

Up to this time twelve cases operated on in this way have been

recorded in this country, seven of which were successful and five were failures; two were fatal. The weight of surgical opinion seems to be against the operation. The writer refers to the fact that the operation has not been attempted since the introduction of the Trendelenburg position. Before this position was devised, the operation was exceedingly difficult, as the intestines fell into the pelvis and obscured the field of operation. With the patient inverted, the intestines are carried toward the diaphragm, there is a clear field, and a better opportunity for separating adhesions. As usually obtains, the ligaments and supports of the uterus are much weakened, and these structures can be shortened or the fundus attached to the abdominal wall in case this should be necessary to maintain the position of the organ.

A woman 25 years of age in her first confinement sustained an inversion which was not recognized for fourteen months. The patient was very anemic. She was placed in the hospital, was given tonics, and the general health looked after. At the end of a week she was ready for operation. On opening the abdomen, at the bottom of the pelvis the inverted uterus could be seen. By grasping the round and broad ligaments, the uterus was brought up with the ovaries and tubes. The uterine funnel which presented was then enlarged by a Sims dilator, after which a Goodell dilator was introduced. The tissues were dense and gave way slowly. After about twenty minutes of dilatation, traction with the aid of pressure from below reduced the organ, except the fundus. When the latter gave way, the peritoneal surface was torn, but not deeply; this was sutured. The relaxed fundus was then stitched to the abdominal wall and the abdomen was closed. Convalescence was uneventful, and there was a perfect recovery.

An Improved Method of Closing Vesicovaginal Fistula.—SMITH, A. L. *Philadelphia Medical Journal*, vol. ix, No. 7, p. 327, Feb. 15, 1902.

The case of a woman 35 years old is reported, who had sustained a tear of the vesicovaginal septum from the vesical sphincter to and including the cervix uteri.

In repairing the defect the vagina was first incised in front of the cervix and the bladder separated from the uterus, the same as in making a vaginal hysterectomy. The laceration in the uterus, which extended as high as the internal os, was closed with catgut. The vagina was separated from the bladder, except where the two torn edges had become united at the fistula. Then with the finger between the vagina and the bladder the edges of the fistula

were divided. The long tear in the bladder was now caught with a catgut stitch which included only the muscular wall. These were placed at angles of the opening, and subsequently the muscular wall was united with a continuous suture which took up about one-eighth of an inch of the muscle on each side of the tear. Care was exercised not to penetrate the bladder or touch the mucous membrane. With the muscular walls brought together in this way, there was a strong ridge at the site of the tear. The bladder was then injected with milk under a pressure of four feet to know if the closure was perfect. The split in the vagina was then closed with silkworm-gut through the side of the bladder, one-half inch to the right of the tear in the bladder wall, and then in the other side of the vagina. When these sutures were tightened the bladder was displaced one-half inch to the left, so that the sutures were no longer in the same plane. A catheter was introduced and fastened into the bladder, this being retained for five days.

The advantages claimed for this method are that it leaves no sutures in the bladder mucous membrane, the stitching of the mucous membrane is avoided, and the obtaining of a union of an edge fully one-eighth of an inch in thickness.

The Clinical Diagnosis of Diphtheria in Relation to Treatment.—BALL, J. B. *Clinical Journal*, vol. xix, No. 17, p. 263, Feb. 12, 1902.

In every instance where the clinical examination points to diphtheria, the antitoxin serum should be injected as soon as possible. However benign a case may seem, we are never justified in omitting the injection of the antitoxin. While the good results which follow the early administration of the remedy are not to be looked for in advanced cases, it is to be given. In cases in which the diagnosis is doubtful, injections should be made without waiting for a bacteriological report. When the throat symptoms are trifling, but giving the constitutional reaction to diphtheria, as shown by pallor, frequency and feebleness of the pulse, apathy and prostration, then the antitoxin is to be given. In many cases in which the diphtheria infection is associated with a different organism, while we cannot expect the antitoxin to have an effect upon the latter, it may favorably influence the case by limiting one of the infections. In a doubtful case in which the symptoms are mild, a bacteriological report may be waited for. In the interval the patient should be strictly watched, and if signs occur which make the diagnosis of diphtheria no longer doubtful, or if laryngeal symptoms develop, the antitoxin should be at once administered. In all cases of croup

in children in which the pharyngeal signs of diphtheria are absent, unless we can exclude the possibility of primary laryngeal diphtheria it is best to inject the antitoxin serum at once.

It is impossible to formulate rules that shall be applicable to all cases. The doubt should generally be in the direction of administering the antitoxin, the determination being based almost solely upon the clinical symptoms, which avoids the delay incident to a bacteriological examination.

Surgical Scarlatina.—De Bovis, R. *La Semaine Médicale*, 22d year, No. 5, p. 33, Jan. 29, 1902.

Under the term traumatic scarlatina the writer refers to what Howse terms surgical scarlatina, and was more correctly referred to by Paget as scarlet fever following operations. The literature of the subject is comparatively rich, as the writer is able to refer to 103 communications. He concludes that the relations between scarlatina and traumatism are intimate; that surgical scarlatina is less frequent in our day is to be attributed to the isolation practiced in hospitals, and to the perfection of surgical asepsis. Reports show that scarlet fever may develop in those who have been operated upon, but who have received an injury as a simple coincidence. These cases are rare. The true surgical scarlatina is due to an infection of an operative or other wound with the specific poison of scarlatina. There is no reason to think that traumatic scarlatina differs from the ordinary sort, excepting in so far as there is a point of lessened resistance on which the germs are transplanted and the period of incubation is lessened. Commonly the ulceration presents a diphtheroid aspect, or is gangrenous. Sometimes the inflammation is trifling, resembling a simple exanthema. It is thought that in most cases there is a direct infection from the hands of the surgeon who has been in contact with scarlet fever patients.

Hypodermic Injections of Veratrum Viride in Eclampsia.—Smith, A. L. *Montreal Medical Journal*, vol. xxxi, No. 1, p. 30, January, 1902.

Three case histories are reported in which eclampsia occurred and was treated by hypodermic injections of veratrum viride. The first was a patient who had been delivered the year before, under chloroform, which was given to reduce eclamptic seizures. At the sixth month of her second pregnancy she developed headache and persistent vomiting. This was treated by the usual methods, and soon there set in convulsions. The tincture of veratrum viride was administered hypodermically in 25-minim doses. Shortly after this

injection there was a seizure, but this was the last. The second case was treated with 20 minims of veratrum viride hypodermically, this treatment being associated with bleeding. A third case was very severe, the woman having had twenty convulsions in four days. The pulse was 180. Upon the administration of the veratrum viride the convulsions soon ceased.

A New Position for Gynecological Examinations.—BRENNAN, M. T. *Le Revue Médicale du Canada*, vol. v, No. 28, p. 328, Jan. 8, 1902.

This novel position in gynecological examinations has been used by the writer for a number of years, and has been of signal service. The accompanying figure shows at a glance the position of the patient, and the manner in which the trunk and extremities are supported. In this position there is complete muscular relaxation, and the patient may be placed in a position varying from 45 degrees to nearly vertical, without bringing into action the muscles of the thigh or abdomen.

FORENSIC MEDICINE.

Poisoning by Dinitro-benzene.—MONKS, E. H. *Lancet*, vol. clxii, No. 2 of vol. i, p. 89, Jan. 11, 1902.

This substance is extensively employed in the preparation of high explosives, and a number of cases of severe poisoning by it have been reported. At ordinary temperatures it is not volatile, but if the substance is warmed it gives off poisonous fumes which cause a rapid intoxication. The striking symptoms are cyanosis and a dark urine. Some individuals have a marked idiosyncrasy. A fatal dose is estimated to be about eight grains for an adult.

The case reported occurred in the family of a laborer who was employed in blasting operations. He took some roburite, which is a high explosive used in blasting, to his home, where it was mixed by his wife with insect powder and sprinkled over the floor and

beds. The family retired early in the evening, the mother being awakened at three in the morning by one of the children complaining of abdominal pain, this being followed by vomiting and diarrhea. During the course of the next few hours the other members of the family were successively taken ill with headache, malaise, and pain in the stomach. At six in the morning the father started for his work, but had to return. They were all taken to the hospital at 2 P.M., and were found to be markedly cyanosed, with quick and shallow respirations and a rapid and soft pulse. In the man the ears and lips were almost livid; the skin over the whole body and extremities was nearly as dark as the face. He was drowsy and lethargic, but irritable when disturbed. There was blunting of the mental faculties. The pupils were not dilated. The veins of the fundus were dark and swollen. The urine was dark in color and free from albumin and sugar. During the next twenty-four hours all of the symptoms disappeared.

The dinitro-benzene is not volatile at the temperature of the body, but it penetrates the skin with remarkable facility. The poisoning in this case was due to the fact that the roburite was sprinkled over the beds and thus brought in contact with the skin. In this case of family poisoning the mother suffered less than the others. This is explained by the fact that she was out of bed during a considerable part of the night attending to other members of the family as they were taken ill, and was thus exposed for a shorter time to the direct contact of the poison.

The X-ray from a Medicolegal Standpoint.—LEONARD, C. L. *American Medicine*, vol. iii, No. 4, p. 145, Jan. 25, 1902.

The results in diagnosis that have been achieved in the use of the *x*-ray are signal, and it is but natural that they should ultimately have considerable medicolegal value. The *x*-ray can only be employed in practical diagnosis, by trained medical men. It is not infallible, and must be supplemented by a broad clinical investigation.

The value and accuracy of the Roentgen ray image in medicolegal cases are dependent upon the experience and professional skill of the expert who made the skiagraph and translated it. The method is comparable to any mechanical process in which skill is demanded in the using of instruments of precision. The Roentgen method is accurate, but not infallible, and expert knowledge in reading a diagnosis is essential. It has the advantage of producing mechanical images that can be compared with the normal findings

in the same individual. These images can be examined by experts and their meaning discussed. It is secondary or opinion evidence, but it is founded on tangible data. The errors are due to a lack of skill in using the rays and to a want of knowledge in their interpretation.

Skiagraphs that are to be used as evidence should be prepared with great care, and all the data as to time of exposure, position of the tube, distance of the plate, and other facts should be stated.

What Constitutes Septic Poisoning in Accident Policies.—KEMPER, G. W. H. *Philadelphia Medical Journal*, vol. ix, No. 7, p. 328, Feb. 15, 1902.

The writer reports his experience in making a claim against a company which had insured him against septic poisoning. He was attending a surgical operation and accidentally infected his ear, which was the seat of an eczematous eruption. When the claim was presented a polite letter was returned stating that the policy did not cover diseases of any kind. This led to an investigation of the clauses in accident policies which are issued to physicians covering septic poisoning. One company issues policies, but restricts the septic poisoning to such cases as do not result from the physician's own carelessness. Another regards the indemnity as payable only when the septic poison has been received as a result of an infection of a wound received in an operation. A study of the adjudicated claims and of the terms of the various policies leads the writer to the conclusion that the term "septic poisoning" in an accident policy is simply put in for the purpose of securing policy holders, but with no idea of paying any claims which may arise under this clause. In most cases it is so artfully worded that there is no difficulty in the insurance company avoiding payment of the claim.

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

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ORIGINAL ARTICLES.

THE SURGERY OF CHOLECYSTITIS.

BY J. CHALMERS DA COSTA, M.D., PHILADELPHIA.

I was asked to briefly discuss the subject of the surgical aspects of inflammation of the gall-bladder, saying something, I take it, of symptomatology, but more of diagnosis and treatment. The allotted time is so short that the paper must of necessity be incomplete and superficial. In view of the fact that the title thus limits the subject, it is not necessary to dwell upon the essential causes of cholecystitis, upon the routes of bacterial invasion, or upon the forms of microörganisms which may be present. It is sufficient to say that various bacteria may, at times, invade the gall-bladder, the most common being colon bacilli, typhoid bacilli, pneumococci, and pus germs, and there may be one variety only, or may be mixed infection.

Further, although these bacteria may enter the gall-bladder, when the flow of bile is unobstructed and there is absolutely no block to the drainage of the sac, they rarely do harm and usually die. Bacteria which do not apparently at once establish inflammatory changes may become the nuclei of gall-stones. It seems that the same variety of germ may, under some circumstances, be responsible for a catarrhal inflammation, and, under different circumstances, a suppurative inflammation—in other words, when the bacteria are of full strength and tissue resistance is at a low ebb, suppurative cholecystitis results; and when the bacteria are mild or attenuated and tissue resistance is at a high level, only catarrhal inflammation is produced.

The important point to bear in mind is that stagnation of the bile strongly favors infection, but it is likewise necessary to recall that infection may be the cause of stagnation. These two influences favor each other, and each one intensifies the other; the fact is, it is

possible that infection of the gall-bladder only becomes serious when the bile is stagnated.

Catarrhal inflammation of the gall-bladder and bile-ducts—what is known as acute or chronic catarrhal jaundice—is a condition which belongs, as a rule, to the province of the physician; although, as Mayo Robson has pointed out, we must remember that a chronic catarrhal jaundice may resemble a jaundice produced by organic disease or may be associated with some such condition as gall-stones, cancer, or hydatids. Therefore, when in such a case medical treatment has proved futile, surgical treatment must be considered.

What is known as catarrhal cholecystitis is a chronic catarrhal inflammation of the gall-bladder, unassociated with jaundice; and the diagnosis usually made is cholelithiasis. In this condition the gall-bladder becomes thickened, and is frequently thrown into folds and pouches. The mucus which is secreted is very thick, and accumulates in masses; and the descent of these semisolid plugs may lead to blocking of the cystic duct or may produce attacks not to be distinguished from attacks of gall-stones. In such cases the gall-bladder, as a rule, is distinctly distended, but hardly to a sufficient degree to permit of palpation. Furthermore, as Robson points out, if gall-stones have not been present, there are no adhesions to surrounding structures. The condition above described may have resulted from gall-stones which have passed away, or may be associated with the presence of gall-stones.

I recently operated upon a case under the supposition that gall-stones existed. On opening the abdomen a large, thick, and non-adherent gall-bladder was discovered. The mucous membrane was thrown into folds and convolutions; the cavity of the bladder was filled with thick, tenacious mucus; and here and there in the mucous membrane of the gall-bladder were minute concretions. The patient was cured by extirpation of the mucous membrane and subsequent drainage, a plan that has been advocated by Mayo, of Rochester, as a substitute for cholecystectomy. In this case it seems probable that stone-formation was following upon catarrhal cholecystitis.

In another case there had been violent symptoms of gall-stone colic in a woman of some 40 years of age, and several stones had been recovered from the feces. Opening the gall-bladder failed to disclose any gall-stones, but showed a condition of catarrhal cholecystitis.

Jaundice does not often appear in catarrhal cholecystitis when gall-stones are not present. Very rarely, however, it is noted; but

in such a case it is trivial and transitory. The attacks of pain to which people with catarrhal cholecystitis are liable are similar to those met with in persons with gall-stones; but the pain due to the passage of a plug of mucus is much less severe and much briefer than that due to the passage of a gall-stone. Again, as already mentioned, jaundice is not apt to ensue in the first case; and besides, as Robson has pointed out, in cholelithiasis there is usually some tenderness on pressure in the gall-bladder region, whereas this is absent in uncomplicated catarrhal cholecystitis.

In the majority of cases catarrhal cholecystitis is curable by medical means, but in a very large minority medical means will fail. In such cases we shall probably be uncertain whether or not we are dealing with gall-stones, but an operation is indicated in either case. The operation of cholecystotomy is performed, the gall-bladder is drained for a week or more, and this treatment will almost invariably produce a cure.

Croupous inflammation of the gall-bladder and the bile-ducts is an extremely rare condition. It is due to the formation of a thick or membranous material in the bile-passage, which causes biliary obstruction and consequent spasmodic contraction of the gall-bladder. The symptoms are practically identical with those of gall-stones. Mayo Robson says that an examination of the evacuations may discover membranous intestinal casts; and, as membranous enteritis is usually associated with croupous inflammation of the gall-bladder and bile-ducts, we may thus reach a diagnosis. It may even be that we will be able to find in the evacuations a cast of the gall-bladder. If medical treatment fails to cure such a condition, the operation of cholecystotomy should be performed, and drainage should be employed for a considerable time.

When bacteria of greater virulence are introduced, or when tissue resistance is at a low ebb, one of a number of conditions may arise. We may have a simple empyema of the gall-bladder; we may have that dangerous condition known as acute phlegmonous cholecystitis, with or without gangrene of the gall-bladder; we may have infective cholangitis, suppurative cholangitis, and ulceration of the gall-bladder. Besides these definite diseased conditions, there may be most disastrous consequences: perforation into the peritoneal cavity, into the gastrointestinal canal, into the retroperitoneal tissues, etc.; the breaking of an infected area into the portal vein; the development of a hepatic abscess; pericystic abscess; the formation of dense adhesions; the extensive destruction of mucous membrane; the conversion of the gall-bladder into a mass of fibrous tissue; and so on.

What will particularly strike us, however, is the similarity which the possible changes of acute cholecystitis bear to the possible changes of acute appendicitis. In each structure there may be a catarrhal inflammation, which progresses no further than this, or which advances into some more dangerous form; in each structure blocking or stagnation favors infection and greatly aggravates existing infection; in each there may be suppuration, there may be ulceration, there may be gangrene and perforation, there may be complications and consequences the most disastrous and fatal; and in each, it may be added, prompt surgical intervention is usually life-saving.

When a catarrhal cholecystitis eventuates in suppuration, we have the condition known as simple empyema of the gall-bladder, a condition which is rare, unless gall-stones are present, or unless typhoid fever exists or has existed. When a gall-duct is blocked with mucus, or swollen mucous membrane, the condition is known as hydrops, and in hydrops the gall-bladder is distended with mucus or altered bile. When hydrops undergoes suppuration, simple empyema is produced. In the mild condition of suppurative catarrh or simple empyema, we remember, the vast majority of cases are associated with gall-stones; hence, in the great majority of cases there is a history of a number of attacks of biliary colic. The pain finally becomes persistent, instead of intermittent, and a definite swelling is detected in the gall-bladder region. This swelling is tender on pressure. In most cases there are definite constitutional symptoms; in many cases the symptoms are slight; in some they are severe.

The slight symptoms are some elevation of temperature, a rather rapid pulse, and a tendency to nocturnal sweating; the more severe symptoms are chills and a remittent fever, with profuse sweats. When we have the mild symptoms, the case is one of simple empyema; when the more severe symptoms are present, some dangerous change is taking place—most often ulceration of the gall-bladder.

In simple empyema the patient usually shows advancing loss of flesh, the appetite is poor, and there is considerable thirst; but very rarely is there distinct jaundice. In cases of simple empyema, as in those of ordinary catarrhal cholecystitis, an enlarged gall-bladder may be mistaken for a displaced kidney. As Henry Morris has pointed out (*British Medical Journal*, 2, 2, 1895), movable kidney and enlarged gall-bladder are each most frequent in women; the right kidney is vastly more apt to be movable than the left, and we may find a movable kidney and an enlarged gall-bladder in the same

individual. In each there is a tumor in the right hypochondriac region, extending also into the umbilical region. It is likewise true that the enlarged gall-bladder, like the enlarged kidney, can in some cases be pushed backward toward the loin, or even to the left of the middle line.

Henry Morris lays down the following rules, to enable us to differentiate these two conditions: He says that we should remember, first, that an enlarged gall-bladder, as well as an enlarged kidney, is a common cause of movable abdominal tumor. Second, we should always ask whether there has ever been a definite attack of jaundice. Third, an enlarged gall-bladder can invariably be palpated, whereas a movable kidney, unless it is enlarged, cannot always be felt; at times it is detected easily, at other times it is obscured, and sometimes it may not be found at all. Fourth, the fact that the tumor varies in size at different times bears no part in the diagnosis, unless with diminution of swelling there is notable increase in the amount of urine. Fifth, a gall-bladder containing stones feels a great deal harder than a movable kidney. Sixth, the study of the mobility shows that however freely a gall-bladder may move, this movement is invariably in the arc of a circle, the center of which circle is beneath the edge of the right lobe of the liver. An enlarged gall-bladder cannot be pushed down toward the pelvis, unless the liver is likewise movable; a movable kidney moves practically in all directions, and can often be made to pass between the examining fingers, and it also has a strong tendency to return to its proper position in the loin. If an enlarged gall-bladder be pushed into the loin, it will not remain there, but will instantly spring out; if a movable kidney be pushed into the loin, it tends to stay in that position. Other points are made in diagnosis—especially the relation of the colon to the tumor, which, however, does not furnish altogether reliable indications (Henry Morris, in *British Medical Journal*, 2, 2, 1895).

If simple empyema is opened and drained at an early period by the operation of cholecystotomy, a cure can usually be readily effected. After the gall-bladder is exposed, it should be surrounded with gauze pads, a quantity of fluid should be evacuated by means of an aspirator, an opening should be made, the viscus should be irrigated with salt solution, a search should be made for the obstructing cause in the cystic duct, and this cause should be removed; in some cases it will be found that the walls of the gall-bladder are so softened that we cannot stitch them to the abdominal wall, and in other cases it will be found that there is beginning ulceration of the gall-bladder or disseminated abscesses through its walls. In such a case, cholecystotomy with drainage is the proper operation.

In some cases, again, a pericystic abscess is found, the microörganisms having passed directly through the gall-bladder. When a pericystic abscess exists, the operation is often difficult and dangerous. Senn, in some of these cases, advises that we first drain the abscess, and then after a time open and drain the gall-bladder. Mayo dissents from this view, and advocates an immediate radical operation.

Occasionally we find a condition which may be called recurrent simple empyema of the gall-bladder. An individual develops pain and fever, tenderness, and tumor, at intervals; and then the symptoms clear up, only to recur, until finally they become persistent or very severe, because of the development of some complication. In these cases, after a time the tumor ceases to be manifest during the attack; and when an operation is performed, a small, deeply placed gall-bladder may be found—a gall-bladder which contains purulent fluid, and is adherent to and hidden under the surrounding organs. In such a case Senn advocates the operation in two stages, although Mayo and some other operators oppose it even then.

Acute phlegmonous cholecystitis is an extremely serious condition, which is apt to eventuate in gangrene of the gall-bladder. It is called by some acute empyema. In this condition there may be rapid peritonitis and death, even without perforation of the gall-bladder walls; but in many cases, just as in appendicitis, the gall-bladder walls may be perforated. It is usually associated with the presence of calculi, but may arise when no stones are present; and in some cases the cause seems to be a fever, like typhoid or septicemia. The disease comes on with sudden and violent pain in the gall-bladder region—a pain which frequently radiates to the right shoulder, and which quickly becomes generalized throughout the abdomen. There is tenderness, great rigidity—most distinct over the region of the gall-bladder—thoracic respiration, exhausting vomiting, and septic fever; and unless the surgeon interferes, general peritonitis soon destroys the patient. In some cases jaundice is present; in many it is absent. In the less severe forms pericystic abscess develops, and is localized by adhesions; in the more severe ones there is no attempt at limitation of the infection.

In one case of this disease on which I operated in the Blockley Hospital, a large gall-stone was impacted in the cystic duct. There was intense jaundice, tenderness, violent pain, marked abdominal distention and rigidity, chills, and septic fever. When the abdomen was opened, it was found that a portion of the gall-bladder was gangrenous, and that a calculus was projected through the gangrenous

opening. An attempt was made to perform cholecystectomy, but the patient's condition was so desperate that it was not persisted in. The infected gall-bladder, after the stone had been removed, was packed about with iodoform gauze. This patient recovered from the operation, but died some weeks later because of cardiac complications.

It is this form of cholecystitis that is particularly apt to be mistaken for appendicitis. I of all men do not dare to be dogmatic. I have in certain cases failed to make a correct diagnosis. I operated upon a gall-bladder case thinking it appendicitis, and upon a case of appendicitis thinking it gall-bladder disease. The situation of the primary pain is of importance in the diagnosis, and likewise the situation of the tenderness, but a displaced gall-bladder or an abnormally situated appendix will deceive us. A fact to bear in mind in the diagnosis is that usually in acute phlegmonous cholecystitis there is absolute constipation; and when we recall the sudden onset and the abdominal distention, we may mistake the disease for obstruction of the bowels. Furthermore, acute phlegmonous cholecystitis may be confused with perforation of the stomach or duodenum. In any case of doubt, an exploratory incision should be promptly made. When an operation is performed the gall-bladder should, whenever possible, be extirpated, it being just as important to do this as it is to extirpate a gangrenous appendix. If extirpation cannot be performed the gall-bladder should be surrounded with strands of iodoform gauze and a drainage tube should be carried well toward the cystic duct.

In regard to the other inflammatory conditions in this region—conditions which involve the bile-ducts, as well as the gall-bladder—I have not the time on this occasion to speak; and I therefore cannot dwell upon those important subjects, infective cholangitis, suppurative cholangitis, and the various consequences of inflammation, particularly perforation of the gall-bladder, the formation of adhesions, and obliteration of the gall-bladder; nor am I able to take up those interesting changes which result in the pancreas from blocking of the bile-ducts.

In endeavoring to make a diagnosis of a condition in which we believe the gall-bladder to be affected, we must palpate with great care. The patient should be in the recumbent position, the legs and thighs should be flexed, and the head and shoulders should be raised upon a pillow. The patient must be told to breathe quietly and regularly. As Bevan has pointed out, the first thing to do is to feel for and find the edge of the liver, and to seek for the gall-bladder underneath this, using light pressure. If the tumor is

discovered, it is outlined, it is noted whether or not it moves with the liver on respiration, its movability and consistency are determined, and it is subjected to percussion. In some doubtful cases the colon must also be distended with air or hydrogen gas, in order to make out its relation to the mass.

In some of these gall-bladder cases the question comes up whether we shall or shall not do an operation in two stages. In the two-stage operation there is undoubtedly less risk of infecting the peritoneal cavity; but by this operation we put aside the possibility of examining properly the cystic duct and the common duct for diagnostic purposes. In most instances I prefer the operation in one stage.

The operation of cholecystectomy is justly becoming more popular. It should be employed much more frequently in infective conditions than it has been, although in some cases Mayo's method of extirpating the mucous membrane may be used as a substitute.

THE PATHOLOGY OF CHOLECYSTITIS.[1]

BY JOSEPH McFARLAND, M.D.,
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The gall-bladder, a small pyriform sac lying in its own fissure on the inferior surface of the liver, receiving and discharging bile through its duct which communicates with the hepatic duct, appears to be an organ of inconsiderable value. Thus its congenital absence is not incompatible with health, as it is naturally absent in the elephant, rhinoceros, camel, goat, deer, several species of fish, some birds, and some of the rodents, and has been found absent in man in at least fifteen reported cases.

Of these cases in which the gall-bladder was wanting, six were children and eight adults, while the age of one case was not given. In the analysis of the cases made by Eshner, he was led to believe that the majority of them depended upon the obliteration of a previously existing organ rather than upon the congenital absence of the organ. Whether the gall-bladder was congenitally deficient or became subsequently occluded does not matter, as either condition shows us that the persistence of the gall-bladder is not essential to life and health. This is further shown by the fact that the gall-bladder may be surgically removed without subsequent disadvantage to the patient.

The unimportant function of the organ, its peculiarly isolated position, its unimportant contents and the mode of the reception and disposal of its contents, combine to make the diseases of the viscus of inconsiderable importance, so long as they remain localized, and to lessen the possibility of the occurrence of any characteristic symptomatology by which the disease can be clinically recognized. It is therefore chiefly, if not only, when the disease of the gall-bladder extends to other structures that much importance need be attached to it.

There are three principal diseases of the gall-bladder—*inflammation*, *calculus*, and *cancer*—these three being intimately related to one another and probably not infrequently succeeding one another.

Inflammation of the gall-bladder, or *cholecystitis*, depends upon infection. As the normal bile is sterile, the advent of microörganisms into the gall-bladder is to be looked upon as pathological. Two avenues of entrance present themselves: first, *the blood*, by which infection of the wall of the gall-bladder first occurs, the

[1] Read at the meeting of the Philadelphia County Medical Society, Feb. 26, 1902.

entrance of the microörganisms into its contents occurring later; second, *the ducts*, by which the microörganisms may find their way from the intestine into the gall-bladder. Infection of the viscus probably occurs through both avenues, though probably more frequently by the circulation than by the bile-duct. Whatever the avenue of infection, the subsequent changes will depend upon the virulence and peculiarities of the invading microörganisms. If these be mild in operation, slight catarrh of the mucous membrane may be the only pathological change; if more active, suppuration with resulting admixture of pus and bile in the gall-bladder may take place, or the wall of the gall-bladder may be covered with pseudomembrane and show larger or smaller ulcerations. In very severe cases, phlegmonous inflammation may undermine the mucous membrane, interfere with the blood-supply of the organ, and lead to gangrene. In nearly all cases of cholecystitis the extension of the inflammatory process into the cystic duct leads to its early occlusion, so that bile is prevented from entering or leaving the gall-bladder. Such an occlusion may be temporary or permanent, the temporary obstruction being relieved by a return of the mucous membrane to its normal condition, thus permitting the purulent bile to escape. Under such circumstances the bile of the hepatic ducts may become infected and a cholangitis make its appearance. When the obstruction of the cystic duct is permanent, the subsequent changes will vary according to local conditions. A mild superficial inflammation leads to a progressive accumulation of watery mucus by which the gall-bladder becomes enormously distended. This is described as *hydrops vesicæ felleæ*. When the inflammation is more active and suppurative, the gall-bladder may be distended with pus, thus forming an *empyema* of the gall-bladder. This enormous fluid collection distends the gall-bladder until it forms a cylindrical mass descending almost to the pelvis. Rupture of the gall-bladder may take place under such conditions, the effect of rupture varying according to the infectiousness of the bile.

In cases in which the inflammatory process is restricted more distinctly to the deeper tissues, and in cases in which the inflammatory process is extremely chronic, fibroid thickening and contraction take place, reducing the viscus to a small, irregular, thick, pouched tube in which a small quantity of tenacious, dark-colored, inspissated bile is found. It may be by these means that the conditions already pointed out, as absence of the gall-bladder, have arisen. In less mild inflammatory conditions, such as result from infection from the typhoid fever and colon bacilli, a mild catarrh of the gall-bladder

accompanies the growth of the microörganisms in its contents. This causes the bile to mix with an unusual quantity of mucus, by which its viscidity becomes increased. The microörganisms occur in clumps or masses in this viscid material and form the nidus upon which bile salts—bilirubin-calcium and biliverdin-calcium—are deposited, thus beginning gall-stone formation. We thus find gall-stones the result of cholecystitis depending upon infection of the gall-bladder by microörganisms of mild virulence. The formation of some gall-stones thus depends upon precipitation of the bile salts upon a more or less reticulated mass of bacteria. Their structure is originally soft, possibly pulpy, but as more and more salts are deposited they become firmer, and ultimately become hard by the infiltration of their entire substance with cholesterin formed by the epithelium lining of the gall-bladder. All gradations of gall-stone formation can easily be observed in the morbid anatomy room.

Sometimes gall-bladders are found filled with inspissated bile, rich in bacteria, sometimes filled with bile containing a pulpy mass probably a precipitate of the bile salts about this bacteria mass; sometimes the entire contents of the organ will be pasty, mushy, gritty, or gravelly; sometimes a single stone, sometimes a large number of stones, will be present.

Acute cholelithiasis, while thus the result of cholecystitis, later becomes the cause of chronic cholelithiasis. The stones contained within the gall-bladder irritate it in proportion to their number, size, and other physical qualities. A single large calculus with a smooth surface probably occasions very little disturbance, while numerous small calculi, by occasionally passing into the duct, cause periodical attacks of obstruction, with painful swelling of the gall-bladder from retention of its contents. Calculi small enough to enter the duct but not to pass through it, known as "ball-valve" calculi, are also extremely troublesome, by periodically plugging the neck of the bladder and obstructing its ducts. The pressure of the gall-stones upon the mucous membrane lining of the gall-bladder is succeeded by ulcerations and the entrance of bacteria into the tissues of its wall, thus predisposing to phlegmonous inflammation and gangrene. The mural lesions may be so destructive that rupture of the gall-bladder occurs, and the stones escape into the abdominal cavity, the duodenum, stomach, or externally. Very large gall-stones escape into the intestines by ulcerations of the wall of the gall-bladder, a large stone having been known to occasion intestinal obstruction. In very rare cases gall-stones have been vomited after ulcerating their way into the

stomach, and in still more rare cases they have been expectorated after having worked their way through the diaphragm and pleura into the air-passages.

The severe forms of cholecystitis, such as are accompanied by pericholecystitis and gangrene of the gall-bladder, may occasion metastatic lesions of remote organs of the body. If bacteria are absorbed and enter the blood, or if products of bacterial metabolism are absorbed from such lesions, hectic fever and other signs of systemic intoxication may appear. Spontaneous recovery from cholecystitis is usually succeeded by marked induration and contraction of the entire viscus; the organ then appearing small, pale, opaque, and not infrequently showing numerous diverticula in which small calculi are not infrequently contained.

Notwithstanding the clinical evidence, that cholecystitis is more frequent in women than in men, in the aged than in the young, in the sedentary than in the active, in the rich than in the poor, in the overfed than in the underfed, etc., there seems to be very little real relationship between these so-called predisposing causes and the cholelithiasis.

THE ETIOLOGY OF CHOLECYSTITIS.

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The etiology of cholecystitis involves the study of the formation of the chief predisposing cause—that is, biliary calculi. Of course, the term implies an inflammatory condition of the gall-bladder, and, as far as we know, this inflammatory condition can be caused only by the presence in the gall-bladder of microörganisms that infect the mucous membranes; but there is abundant evidence to show that the mere presence of microörganisms in the bile—a condition that, contrary to older belief, is by no means uncommon—does not by itself imply cholecystitis. Of course, under ordinary conditions the gall-bladder, although communicating directly with the infected intestinal tract, does not contain bacteria, and the bile itself is sterile—not because it contains any bactericidal substance, but it has very little nutritive material, and its continual outflow prevents the ascent of microörganisms along the duct. Whenever any interruption in the flow of bile occurs, or when a systemic disturbance occurs associated with bacteriemia, we should expect, on theoretical grounds, to find microörganisms in the bile, especially in the more or less stagnant portion contained in the gall-bladder. Interruption in the outflow of bile can probably be produced in two ways: either as a result of catarrhal inflammation of the mucous membranes of the bile-duct, or as a result of some material in the gall-bladder which may permanently or periodically block the common or cystic ducts.

It is probable that catarrhal inflammation of the common duct extending to the cystic and hepatic ducts, and perhaps even to the gall-bladder itself, is often associated with inflammation of the duodenal portion of the small intestine. There is not sufficient pathological evidence upon this point, but the clinical evidence, such as slight icteroid discoloration of the skin and urine or the absence of pigment from the stools, with pain over the liver, points strongly in this direction. The latter condition is produced by gall-stones, clots, or mucous plugs, the last being not uncommon in severe catarrhal inflammatory conditions of the gall-bladder (Mayo Robson), either chronic or acute, and serving to form a vicious circle. That is to say, the catarrhal condition due to the presence of microörganisms gives rise to the mucous plugs, which in turn interfere with the outflow of bile, and therefore have a tendency to prevent spon-

taneous cure of the infection and actually increase the diseased condition by preventing the elimination of microörganisms from the gall-bladder and favoring renewed infection from the duodenum. Clots have been found in the gall-bladder by Claude, after the experimental injection of animals with bacterial toxins, and he suggests that they may form the nuclei of gall-stones.

It is questionable whether the bile ever escapes infection in cases of bacteriemia. We have considerable evidence to prove that it is almost invariably infected during typhoid fever, and there is evidence which shows that it is sometimes infected in pneumonia, although the bacteriology of the gall-bladder in this condition has not yet been as systematically studied as it has been in the former disease. Of course, as we have already said, the presence of microorganisms does not necessarily imply the existence of infection of the gall-bladder. Typhoid fever is favorable to the production of cholecystitis, because there is not only inflammation of the intestinal tract but also bacteriemia. It is perhaps not necessary to mention that this relation was first pointed out by the French authors Gilbert and Girode, and proven by the systematic investigations of Chiari. The relation between typhoid fever and cholecystitis is usually supposed to be indirect—that is to say, as a result of the infection of the gall-bladder, gall-stones are produced, and these irritate the mucous membranes and may or may not cause inflammation of it. If inflammatory change does occur, it is sometimes associated with the presence of the typhoid bacillus, which has remained latent in the bile, or sometimes with the presence of other microörganisms whose entrance has been facilitated by the existence of the gall-stones.

It must be admitted that until the publication in the year 1893 of the results of Chiari's work, the discovery of gall-stones and of cholecystitis following typhoid fever was looked upon as an interesting curiosity. Chiari's attention was called to this question by an autopsy upon a boy of 12 years who died in the fifth week of an attack of typhoid fever, as a result of necrotic infection of the gall-bladder with secondary circumscribed purulent peritonitis. He found typhoid bacilli in pure cultures in the bile, and was able to stain them in the walls of the gall-bladder. He therefore examined the gall-bladders of twenty-two cases of typhoid fever, and found the typhoid bacillus in nineteen. In fifteen cases it was alone, and in four it was associated with other microörganisms. Microscopic examination of the walls of the bladder in the nineteen positive cases showed inflammatory changes in thirteen, which consisted of round-cell infiltration of the mucosa, congestion of the

blood-vessels, and edema of the tissues. He also found the bacilli in the large gall-ducts.

In the post-mortem examinations that I have performed upon cases of typhoid fever, I have, wherever possible, made cultures from the bile. In six cases the results were positive, and in three of them the microörganisms were found in pure cultures. It is an interesting fact that the typhoid bacilli are usually found in clumps as if—according to Richardson—a gigantic Widal reaction had occurred. This led the latter author to suspect that perhaps these clumps of bacilli formed the foci about which the cholesterin deposits that constitute the gall-stones accumulate, and he was able to produce gall-stones in two rabbits into whose gall-bladders he had injected pure cultures of typhoid bacilli. This experiment had previously been attempted with negative results by Gilbert and Dominici. Cushing has also obtained positive results. Considerable evidence, however, had been collected before this experiment was performed, which tended to show that typhoid fever had some direct relation to gall-stones. Miliau, for example, examined some gall-stones removed from the gall-bladder of a woman on the sixteenth day of an attack of typhoid fever, and found typhoid bacilli in their centers. Imhofer mentions the case of a woman 40 years of age who, six weeks after convalescing from an attack of typhoid fever, developed symptoms of peritonitis. An operation was performed, and the gall-bladder found greatly distended; its surface was covered with a fibrinous deposit, and its cavity contained a thick mucopurulent material and a hazelnut-sized gall-stone. Droba mentions a still more remarkable case in a woman 53 years of age, who had had typhoid fever seventeen years before coming under observation, and since then had suffered with repeated attacks of colic. An operation was performed and numerous stones removed from the gall-bladder. Typhoid bacilli were found, not only in the bile, but also in the interior of the stones. This case is remarkable on account of the long persistence of the bacilli in the gall-bladder.

That the bile from an inflamed gall-bladder is an excellent culture medium is shown by an experiment I made some years ago at St. Joseph's Hospital. A sterile test-tube was filled with bile taken from the distended gall-bladder of a patient who had died of typhoid fever. It was kept for a period of more than three months, and from time to time cultures were made from it which showed nothing but typhoid bacilli, and these were constantly used in the laboratory of the hospital for the purpose of making the Widal reaction.

The evidence, however, is not as conclusive as it seems. In fact,

there is some reason to suppose that the opinion that has begun to gain credence, that gall-stones are due only to typhoid fever, is not tenable. Even some of the positive evidence can be interpreted in the opposite manner. It seems remarkable that Miliau's patient should have developed well formed gall-stones in the course of sixteen days; and Chauffard, who has made a careful study of the subject, reaches the conclusion that probably in many cases the gall-stones are preformed and penetrated by the typhoid bacilli when infection of the bile takes place. From the loose texture and friability of the gall-stones there is no reason to suppose that this could not occur, and Gilbert, Fournier, Hannot, and Letienne have shown experimentally that young gall-stones can be so penetrated. Even in old and hard stones Chauffard has found the colon bacillus. In statistics of 171 cases of typhoid fever he was able to find only eighteen that had had attacks of biliary colic after the disease, and five who had had attacks before the disease, and therefore presumably before typhoid infection had existed. In only one of the eighteen cases did the symptoms come on immediately after the attack, and in the others the shortest interval was four years. Moreover, in eighty-six cases of cholelithiasis and cholecystitis only eighteen gave a history of typhoid fever, and in eighty-six other hospital cases of about the same age, fifteen had had that disease. Chauffard also calls attention to the rarity with which freshly formed gall-stones are found after an attack of typhoid fever. Chauffard's investigations appear to have been carefully made, and they seem to prove that the mere discovery of typhoid bacilli in the interior of a gall-stone after an attack of typhoid fever is not sufficient proof that it bears any causal relation to the disease. Moreover, it seems to show that gall-stones are formed comparatively rarely after typhoid fever, and that they occur almost as frequently in patients who have never had that disease. The typhoid bacillus is capable of producing inflammatory conditions without the presence of gall-stones, and Wunschheim claims that this is not infrequent, pus forming in the gall-bladder, and sometimes giving rise to a pericholecystitis with fibrinous deposits or adhesions, or this process may occur independently.

Among the other microörganisms that have been found associated with suppurative angiocholitis and cholecystitis or with gall-stones are the colon bacillus found by Bignami, Gilbert, and Dominici, and especially by Mignot, who has produced biliary calculi by introducing cultures of colon bacteria whose virulence had been reduced into the gall-bladder; the cholesterin accumu-

lated about the fragments of necrotic tissue; and the streptococcus which was found by Dupré in the case of a woman who died with symptoms of chronic icterus and carcinoma of the liver. At the autopsy on the latter case the gall-ducts were found to be thickened and to contain numerous stones, and the walls were covered with a purulent exudate in which numerous streptococci were found. Dupré also calls attention to the cases of Claisse and Malvoz, in which streptococci appear to have been the cause of combined cholelithiasis and cholecystitis. Other bacteria have been found by Hugounencq and Doyen, and a series of experimental inoculations have been made by Gilbert and Dominici with streptococci, staphylococci, pneumococci, typhoid bacilli, colon bacilli, and cholera vibrios, all with negative results.

The route by which the microörganisms reach the bile cannot be definitely determined in the majority of cases. The fact that in typhoid fever we nearly always have a mixed infection of the duodenum and frequently find a pure infection of the bile is evidence, in itself, that the usual route is along the blood-vessels, for it seems certain that if infection occurred along the common duct it would be mixed. Claude has reported two cases in which evidence at autopsy in the form of an infectious arteritis seemed to indicate that the infection was hematogenic. Assuming the infection of the gall-duct, the question arises whether the existence of microörganisms in the bile or the existence of gall-stones is the responsible factor. Janowski suggests that the continual mechanical irritation of the mucous surface predisposes it to infection, but the mucous membranes acquire great toleration for mechanical irritation, and the fact that stones are not infrequently found at autopsy that have never produced any symptoms during life renders it probable that unless they act mechanically to produce stagnation of the bile by occlusion of the duct, and thus favor infection, it is more than likely that inflammation of the gall-bladder will not occur. Infection by direct extension is suggested by Kotlar in the case of the so-called tuberculous disease of the gall-ducts, which he believes is always secondary to a tubercular focus in the liver.

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CHLOROSIS AND ITS RELATION TO THE EYE.

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It was and always will be customary to associate chlorosis with the female sex, and that too at about the age of puberty. Rarely is chlorosis observed earlier than the thirteenth or fourteenth year, or later than the twenty-third or twenty-fourth. In the main these statements are correct, but in truth they are false; for chlorosis does appear in the male sex, and not so seldom as it is thought. It is often seen later than the thirtieth year. This late-appearing form of chlorosis is significantly called chlorosis tarda, and does not differ clinically or pathologically from the chlorosis primævitatis. Neither are the eye lesions, when present, different in character or severity in these two varieties of chlorosis.

The term chlorosis as it is now accepted is a misnomer; yet it would be difficult to offer another which will shield fewer faults than just chlorosis. One familiar with the Greek derivation (χλωρίασις, from χλωρίξειν) can readily detect wherein it is faulty with reference to the train of symptoms obligatorily present in what we now designate as chlorosis.

Before entering into the question of ocular diseases which appear as a consequence of or are aggravated by chlorosis, let us give a brief review of the pathology of chlorosis. It is very interesting from the fact that chlorosis, which formerly was looked upon as a functional blood disorder, is now unhesitatingly recognized as an organic lesion of the same.

Atkin's view, that chlorosis is a purely functional disease of the female organs of generation in the unimpregnated state, is no longer tenable. For, since a more thorough microscopical and chemical analysis of the blood, Virchow, Osler, Rocci, Thayer, and Forcheimer have proven that chlorosis is a primary organic anemia, therefore not a functional blood disorder. The functional qualities of the chlorotic blood are not so much interfered with as that the deficient organic constituents of the corpuscles cause a functional inactivity or impairment.

The most rational pathologic view of chlorosis is to look upon it as an insufficiency of the biochemic function of the red blood-corpuscles associated with a diminution of the hemoglobin. Accepting this view, then the hypoglobulia and poikilocytosis are naturally

only secondary causative factors, and that the retina should suffer so infrequently under such conditions in a structural or nutritive manner is indeed singular. Very few purely retinal lesions are recorded as being due to chlorosis. Certainly, if a retinal lesion is present at the time a chlorosis supervenes, it is greatly aggravated by it. The one form of retinal disease, namely, retinitis pigmentosa, is much more rapid in its progress in a chlorotic than in a person with any other concomitant disorder.

As the hypoglobulia and poikilocytosis are secondary causative factors, therefore we must say that the menstrual disorders are not the cause of chlorosis, but necessarily maintain the opposite—*i.e.*, chlorosis is productive of menstrual vagaries. Nevertheless, we must not lose sight of the relation existing between the physiological functions of menstruation and the existing chlorosis. For the menstrual period, acting as a primary or simple anemia in chlorosis, materially aggravates it. There must be an intimate association between these two conditions, since Neimeyer says that girls menstruating at thirteen or fourteen years, with undeveloped breasts, pubis, and uterus, invariably would become chlorotic.

The one fact above all others that in vertebrates the cytogenesis and hemoglobingenesis are independent functions will put chlorosis on an organic and not on a functional basis.

The red corpuscle is born colorless and assumes its redness from the hemoglobin it is capable of producing out of the absorbed organic iron. This gives us a cogent reason for the hereditary tendencies of chlorosis. It also, in a measure at least, may account for a number of congenital cataracts in the offspring of chlorotic females. This is reasonable in so far as the tone of the circulation is at fault, and the nutritive power of the blood decidedly decreased. Perchance this suggestion may act as a clue in solving the question why all congenital cataracts are soft. Certainly this point has a decided bearing in individuals with a pronounced tendency for myopia, as the ocular coats must necessarily suffer, when the nutritive coefficient of the blood is so reduced as it is in chlorosis.

The hemoglobin, as has been conclusively proven in man and in the lower animals, is manufactured in the intestines. The amount of hemoglobin can be increased by introducing such agents as will prevent the putrefaction and the reduction of organic iron by the sulphides and sulphites. Herein lies the rationale of the iron therapeusis in chlorosis.

Likewise does the above fact tend to substantiate Sir Andrew Clark's constipation theory of chlorosis, and gives a certain weight

to Clement's infectious theory. If chlorosis can be ascribed to the latter, then it is surprising that autointoxications are not found in chlorosis. Also for the same reason, then, it is strange that so few eye complications arise. For, ocular complications are quite common in autointoxications of the severer type, to which certainly chlorosis would belong. In toxemia or autointoxication the retina and nerve head are prone to become implicated, giving rise to a neuroretinitis or simple neuritis, with or without pin-point hemorrhages or exudations into the retinal meshes. However, these very complications are not so rare in chlorosis as one might believe—statistics show quite an array of such cases.

Whether or not the few cases reported in which the retina was implicated are to be looked upon as coincidents or due to the chlorosis *per se*, is in the minds of some a mooted question. The writer looks upon these retinal lesions, not as a coincident but as the result of an autotoxemia due to the chlorosis itself.

Those who favor Sir Andrew Clark's constipation theory must consider chlorosis to be a copremia of a rather chronic type. If this theory is a fact, then the large amount of ptomaines and leucomaines, which are more or less constantly present in the intestines of any habitually constipated being, must be absorbed by the lacteals and carried into the general circulation and thus reach the eye. In such cases, then, one could frequently expect severe chorioidal, retinal, or optic nerve lesions. Still they do not appear nearly as often as in a true copremia; hence chlorosis, from this point of view, is not a copremia.

The mere absence of the train of symptoms dependent upon the absorption of the products of fermentation and decomposition in chlorosis will greatly detract from the value of the above theory.

At one time the anatomical basis of Virchow held sway as being the cause of chlorosis. Virchow professed to find in each case a poorly developed vascular system. The large arterial branches were thin-walled, especially the aorta and its immediate branches; associated with this vascular defect there was an undeveloped uterus and genitalia. Though all such findings are present in an anemia, leucocythemia, leucemia, and various heart lesions, they are not by any means pathognomonic of chlorosis. However, in every case of chlorosis the retinal arterial pulsation, when present, is an indicator of the severity of the attack. Then, too, the light reflex or streak on the retinal arteries is prone to be very faint, if not entirely absent. The venous pulsation in the retina is of no indicative value whatsoever. Again, the minute hemorrhages into the retina are not

so often found as we might expect if the vessel walls were in any way thin or diseased as Virchow suggested.

Recently the increased alkalescence of the blood has been held as the etiology for chlorosis. This theory was brought forth by Graeber, but Kraus, an accurate observer, denies it any value. No doubt the increased alkalescence would produce a poikilocytosis and an oligocytosis, but whether a deficiency in hemoglobin would result cannot be asserted. And unless we have a deficiency in hemoglobin, we cannot have a chlorosis.

Because of the constant anatomical changes present in the blood of a chlorotic, the disease can be assigned to the category of the primary essential anemias. What are these constants?

1. Immerman says chlorosis differs from all other anemias in that the albuminous bodies of the blood serum are present in normal or increased amount. It is rather strange that a normal blood constituent should be more abundant in chlorosis than in any other anemia, when nearly the same corpuscular changes are present in each form of anemia. Yet such is the fact.

2. The red corpuscles may be normal as to size and number, but are deficient in hemoglobin.

3. The red corpuscles may be diminished in number and size as well as deficient in hemoglobin.

4. The red corpuscles may be diminished in size, normal in number, but deficient in hemoglobin.

The third anatomical constant gives rise to the severest form of chlorosis. In this variety we have a poikilocytosis, a micro- and macrocytosis. No stage of chlorosis, however, has a leucocytosis; but there always is a deficiency in the amount of hemoglobin no matter in what condition or proportion the other blood constituents are.

The average number of erythrocytes in a chlorotic is in the vicinity of 3,000,000 to 3,500,000. In an uncomplicated case we have no leucocytosis, poikilocytosis, micro- or macrocytosis. This reduction in the number of red cells, deficient in hemoglobin, gives a peculiar color to the retina, and accounts for the absence of the light reflex on the arteries as well as for the photophobia and retinal exhaustion.

To sum up the pathology of chlorosis we must say, in view of the statements above briefly outlined, that it is an oligochromemia dependent upon a faulty hemopoiesis, the latter in turn being due to a deficient hemoglobingenesis. In other words, we can call it an autotoxemia and the lesions in the fundus as the result of this toxemia.

The ocular lesions in a case of chlorosis tarda are of a graver nature than the same lesions in a chlorosis primæva. So much for the pathology of chlorosis.

As chlorosis is so frequent among schoolgirls who are trying to go on with their work, any eye-strain ought to be relieved. However, nearly all the headaches, nausea, and vertigo are often flatly attributed to the constitutional disorder, when really the eyes are directly at fault, or secondarily because of the chlorosis.

If any refractive error may give rise to these symptoms in one not suffering from chlorosis, the more so would they give trouble in an individual with chlorosis. Though ordinarily a chlorotic can accomplish her school work with some difficulty, it would be impossible for her to do so if her eyes were at fault in any way. All additional strain should be relieved, and the nervous system assisted in maintaining sufficient force for her to accomplish the desired object. For often the strain placed upon the muscle of accommodation is too great in view of the faulty nutrition as a result of the chlorosis. A true asthenopia develops in such cases. This asthenopia, though it is corrected by the cure of the chlorosis, ought to be mechanically relieved by glasses, while the girl is going to school and the chlorosis present. Yet too often does the attending physician say that these headaches, nausea, and reflex eye-strain are due to the chlorosis, and keeps the girl out of school; when, if he had the astigmatism, muscular imbalance, the myopia, hypermetropia, or what not corrected, the girl could, without detriment as to the ultimate recovery, attend school with comparative ease. Indeed, the correction of these errors will materially assist the cure, as their correction does away with just so much needless waste of nerve energy—the conservation of which energy is of great importance.

Again, in such girls and boys a follicular conjunctivitis is attended with graver symptoms than in others, especially if associated with any refractive error; yet how often are they overlooked, and needless eye-strain allowed to persist, which by proper local attention can be ameliorated or cured. Especially do such patients suffer in school when the refractive error is myopic in one eye and hypermetropic in the other, or when the astigmatism is against the rule.

In this class of cases, marginal blepharitis is very apt to be present. This is often associated with a conjunctival congestion giving rise to a feeling of roughness. If the condition is not abated, it will lead on to what is known as a conjunctival asthenopia, of a very chronic nature.

Though these conditions are dependent upon the chlorosis, yet appropriate topical applications or proper lenses will mitigate, if not cure, such lesions. This materially adds to the comfort of the patient and expedites the cure as a whole.

Oftentimes in these individuals the asthenopia is accountable for many a headache which is incorrectly ascribed to the chlorosis. Though the patient may possess a normal eye or such a low degree of refractive error as would not account for the symptoms, yet any accommodative effort will cause an exhaustion because of the chlorosis. This exhaustion can be obviated by relieving the strain of the ciliary muscles in that the proper glasses are prescribed for near work. If asthenopia in an otherwise healthy individual produces annoying headaches, it is certain that these symptoms would be of a severer type in one suffering from some organic blood lesion, as chlorosis. Edema of the upper and lower lids has also been noticed. This, however, is more often present in the lower lid.

Though the muscular balance for distance may be normal, yet the patient is in many instances unable to maintain single vision for the near point, as long as the chlorosis is present, thus having an array of annoying symptoms. While another, not a chlorotic, may evince the same muscular conditions, both for the far and near points, yet, because of normal blood and nerve force, he is able to overcome the defect and have no symptoms. This the writer has proved in quite a few cases.

Photophobia is often present and may be very annoying, causing headache or excessive blurring. By the use of coquilles these symptoms are corrected. It is not a true photophobia, but a retinal exhaustion due to the light. This retinal exhaustion is dependent upon the inability of the retina to maintain a pigmentary equilibrium owing to the lack in pigment reconstruction. Such headaches, though often ascribed to chlorosis, can only be corrected as stated.

In some individuals with chlorosis the light at times causes annoying headaches and photophobia. The fault this time is not in the retina but in the iris. The pupil in these cases is often larger than in the normal state, thus allowing too great an influx of light. This likewise can be corrected by mild miotics or coquilles, preferably the latter. The pupilary light reflex will be adjusted with the cure of the chlorosis. This disturbance is dependent upon the insufficient nutrition in the sympathetic and lenticular ganglia. The effect upon these centers is due to an autointoxication.

You may, if you please, call all these eye symptoms, as just detailed, reflex phenomena which are or can be corrected by treat-

ing the cause—namely, the chlorosis. True, yet the majority of these symptoms are due to ocular conditions which are permanent and are only made manifest because of an inequality in the supply and demand of nerve force as a result of the chlorosis.

Now, one of the main points in the treatment of chlorosis is rest, both muscular and nerve; therefore by quieting the eye distress you obtain nerve rest, an essential factor in chlorosis. For, as stated, in many cases the headaches, nervousness, nausea, dizziness, and allied symptoms are due to eye disturbances. Why then let them go uncorrected and impede the rapidity of a cure?

Furthermore, in chlorotic schoolchildren the range of accommodation is often limited, though no refractive error of any kind is present. Yet persistent headaches are complained of, and, as is quite natural, are ascribed to the chlorosis. These headaches can be relieved and just so much energy spared by having a properly adjusted pair of lenses for the close work. It is just during near work that these headaches come on, and are then ascribed to the sedentary habits.

When there is a deficiency in the quality of the blood supply to such a delicately arranged mechanism as the intrinsic motor apparatus of the eye, it is no wonder that disturbances of the above character are to be expected in chlorosis. Nevertheless, it is true, symptoms due to apparently minor causes are often overlooked, when such a grave systemic lesion as chlorosis is present.

As already noted, congenital cataracts can be ascribed to the fact that the children were born of chlorotic mothers. In such cases we are dealing with chlorosis tarda, which when of a mild character is often overlooked or considered a sequel to childbirth, when truly it was present prior to the pregnancy, but overlooked. The writer has seen at least three cases of congenital cataracts which would come under this heading. In these cases apparently much more time was consumed in securing lenticular absorption by discission than in the ordinary congenital cataract.

As to the deeper eye lesions found in chlorosis, we may mention pulsation of the fundus vessels, neuroretinitis, neuritis, retinitis, and optic atrophy. In the past, clinicians were prone to look upon these concomitant fundus lesions as coincidents, and they ascribed no etiological factor whatsoever to the chlorosis. However, since chlorosis has been put upon an organic pathologic basis, and after carefully analyzing the cases reported as well as those occurring in the writer's experience, no other conclusion than this can be arrived at: optic atrophy, papilloretinitis, arterial pulsations, and retinitis can and

do have a chlorosis as their etiological basis. Whether or not these lesions are to be considered as due to a toxemia, an autotoxemia, or a purely constitutional disturbance, cannot be asserted. Perhaps one or more of these causes are associated in such conditions. That this view is correct is corroborated by the fact that with the cure of the chlorosis the fundus lesion in many cases clears up, which lesions certainly would not have cleared if the cause had not been removed. Oliver (*Annals of Ophthalmology*, vol. vii, January, 1898) considers that it is an autotoxemia which causes these fundus disturbances—a view shared by many others as well as the writer.

Glistening patches not unlike those observed in albuminuric retinitis have been seen in severe cases of chlorosis. These blotches, no doubt, are small foci of fatty degeneration in such regions of the retina as are devoid of capillaries. Upon recovery from the chlorosis these blotches disappear entirely. The mere fact that they resemble albuminuric spots should induce a careful urinary analysis. It is often extremely difficult to differentiate between the patches resulting from chlorosis, albuminuria, and diabetes by a simple ophthalmoscopic examination. As a chlorosis may exist without ever being suspected, the appearance of these patches will assist in diagnosis. They cause very little, if any, reduction in vision. In this particular they differ materially from the other spots referred to. These patches are prone to appear in the region of the macula or in the periphery of the retina. This lesion in the fundus is the least frequent of all the deep-seated lesions accompanying chlorosis.

The pulsation of the retinal artery has been frequently noticed. This is indicative of an extreme diminution in the blood-pressure in the arteries, particularly in the larger trunks. This retinal pulse is not a true pulse, but an intermittent influx of blood, and is due to a falling of the blood-pressure during systole below the intraocular tension; during diastole the blood-pressure overcomes the ocular tension. The ocular tension is not necessarily normal or reduced in such cases. An interesting feature in this pulsation is its usual presence in the optic papilla and in the adjoining retina (Becker). A true venous pulse—the progressive peripheral pulsation of the vein—is now and then observed. When this venous pulse is present, it is more indicative of the severity of chlorosis than when the arterial pulse alone is noticed. The former is due to the passage of the pulse wave from the arteries to the veins, or due to the varying conditions of pressure in the cavernous sinus. Therefore a fundus examination in chlorosis will often reveal a circulatory lesion otherwise not looked for or suspected.

The next frequent fundus lesion is optic atrophy. The atrophy is either a primary one or a continuation of the retinitis. The former variety is the more significant, because it may lead to a faulty diagnosis; for optic atrophy is often an early symptom of brain tumor. And, as headaches, muscæ volitantes, nausea, and vertigo are frequently present in both, the importance is apparent. Such an error has been reported (Englehardt: *Münchener Med. Woch.*, Sept. 1, 1900), and perhaps others, supposedly brain tumors, if a blood examination had been made, would have been diagnosed as chlorosis. You cannot get the same blood conditions in tumor of the brain as you do in chlorosis, though you may have identical ocular symptoms. In such cases the blood examination is the only reliable differential point. In the case above referred to, a post-mortem showed an absolutely normal brain. To his credit be it said that chlorosis was suspected during life. In this case a double optic atrophy, marked anemia, and brain tumor symptoms were elicited, but the chlorosis never was treated or even diagnosticated. Englehardt's case is the only one of this nature on record in which a post-mortem was held. Therefore the case is of paramount importance in this particular, showing how easily an error can be made when symptoms are similar. The optic atrophy in chlorosis is permanent.

Several investigators (Bannister, Dieballa, Oliver, Gowers, Herschell, Knies) have reported cases of chlorosis with either unilateral or bilateral papilloretinitis. Each case made a good recovery—in fact, in nearly all was a return to the normal visual acuity attained. In one case, that of Bannister's, the lesion was bilateral and the question of brain tumor was raised, but the blood examination revealed the true state of affairs—namely, chlorosis. The majority of the cases are bilateral lesions, though Bannister and Oliver each reports a case with unilateral papilloretinitis. The older writers, such as Gowers and Herschell, look upon this papilloretinitis as a coincident, but they lost sight of the potent factor of autotoxemia. This papilloretinitis is identical with that occurring in other severer blood dyscrasia in which there is an autotoxemia. The tortuosity of the vessels, especially the veins, is a prominent feature in this chlorotic papilloretinitis.

The prognosis in this variety of papilloretinitis is nearly always very favorable. Another prominent feature in this class of cases is that the ocular lesion improves *pari passu* with the chlorosis, which, indeed, is quite logical.

It is interesting to note that the majority of ocular lesions occur in the chlorosis primævitatis and not in the chlorosis tarda. A

careful search in the literature fails to give a true case of chlorosis tarda with lesions in the fundus.

One case with the rather infrequent blotches as a fundus lesion, which recently came under the writer's observation, is the following: A girl of 16 years, with marked chlorosis, presented asthenopic symptoms of an aggravated nature. Upon examining her fundi, glistening white patches were found in the retina, situated in the neighborhood of the macula. Her visual acuity was 20–20, with a hypermetropia of 1.50 diopters in each eye under atropine. At first thought, these patches were associated with albuminuria, but repeated urinary examinations failed to show any albumin. A careful blood examination and other physical symptoms would permit of no other diagnosis than chlorosis. These spots or blotches, as already noted, are considered as foci of fatty degeneration. With the cure of the chlorosis these patches entirely disappeared, and vision still remains normal.

In conclusion, a summing up of the subject-matter will give us the following data:

1. Optic atrophy, papilloretinitis, and pseudoalbuminuric spots can and do have a chlorosis as their causative factor.

2. Double optic atrophy associated with chlorosis may simulate brain tumor to a marked degree.

3. Headaches due to a refractive error and asthenopia are of a severer type and are often aggravated by the chlorosis.

4. Arterial pulsation in the retina is indicative of the severity of the disease, as is also the venous pulse.

5. The fundus lesions in chlorosis are the result of an autotoxemia.

6. The prognosis in nearly every case is favorable, considering the severity of the hemic lesion, excepting in optic atrophy.

7. The foci of fatty degeneration in the retina deserve special attention, so as not to be mistaken for albuminuric spots.

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SYDENHAM'S CHOREA IN ADULT LIFE.

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That the chorea of childhood as described by Sydenham is a disease of early life is a statement that admits of no dispute; that it is as rare in adult life as it is common in childhood is also true. That it never occurs after puberty, however, will be disputed by any one who is in a position to see a large number of cases. Yet this statement was made by Gilles de la Tourette in a paper read before the Neurological Society of Paris, June 7, 1901 (*Revue de Neurologie*, p. 254). He reported in his paper three cases of "maladie de tic convulsif," all of which had been sent to him with a diagnosis of chorea. He therefore draws the very interesting if not startling conclusion that all so-called cases of chorea occurring after puberty are in reality either "tic convulsif" or hysteria. Tourette's paper was not accepted as conclusive, and Joffroy took exception not only to the above but also to the statement that there existed no relation between chorea and rheumatism. He had seen undoubted cases of chorea after puberty, and quoted several authorities to the same effect. It is with Tourette's paper in mind that I report three undoubted cases of chorea occurring in adult life. The first of these occurred in private practice; the other two were dispensary cases in the service of Dr. Spiller, to whom I am indebted for the privilege of reporting them.

The most interesting of these three cases occurred in a young white woman, aged 21, who had been married one year previously. She had had the usual diseases of childhood, typhoid at 14, but had never had chorea in childhood. She first came under my observation three months after marriage, suffering with an acute cystitis which yielded readily to treatment. In May, 1901, she again came under my care for persistent morning vomiting, which she attributed to pregnancy. Her menstrual period had stopped in March; the abdomen was enlarged; her clothes were too small; and she had a sense of fulness in the breasts. A vaginal examination at this time and one month later revealed no signs of pregnancy. One week after the first examination she developed pains in the knees and elbows, and began to have irregular, purposeless choreic movements in the right hand, spreading in a few days to all four extremities. She was continually dropping dishes and other objects, and was

rather awkward in her movements. The reflexes were prompt, motion was good, and sensation normal. The heart's action was irregular, but no murmurs were present. There were no hysterical stigmata. The movements were the typical, irregular, jerky, purposeless movements of the chorea of Sydenham, and had nothing in common with the rhythmical hysterical choreic movements or the purposive twitchings of tic convulsif. The movements were not influenced by suggestion, and only disappeared after seven weeks of constitutional treatment with Fowler's solution and other measures. The menstrual period returned with the cessation of the movements, and my previous assurances to the patient that she was not pregnant were confirmed. In the summer a true pregnancy followed, and in March, 1902, she was delivered of a healthy girl. The choreic movements ceased during the true pregnancy. With the exception of the symptoms associated with the pseudopregnancy, evidences of hysteria have been entirely wanting. Nothing that could be considered as a true tic was present at any time in the course of the disease.

The second case was in a full-grown, well developed negress aged 18, very black, and with no admixture of white blood so far as she knew. Her grandfather had three strokes of paralysis, but there was no other nervous disease or chorea in the family. She had measles as a child, and an attack of St. Vitus's dance at seven, lasting six weeks, but not as severe as the present attack. Menstruation began at 14, and has been regular and normal. There is no history of rheumatism or sore throat. Her brother died rather suddenly immediately preceding the onset of the present attack. The twitchings began six weeks previous to examination, beginning in the tongue, and afterwards extended to the head, extremities, and diaphragm. The movements were continuous, of the same irregular character, worse under examination, and associated with distinct weakness in the left arm and leg. Her speech was thick and only with difficulty understood. The respirations were irregular and jerky in character, but of normal frequency. The tongue was very red on the edges and at the tip, and the patient complained that the movements kept it very sore. Her mother stated that her mind was "flighty," but outside of the dulness and irritability so frequently met with in chorea no other psychic symptoms could be discovered. Reflexes were active, and there was a distinct diminution in the reaction to pain and touch on the left side of the body. She slept poorly, and had been getting worse. Under the bromides and Fowler's solution there was a very decided improvement after three

weeks. The patient did not return to the clinic, and was lost sight of.

The third case was that of a Russian Jewess aged 17, who has been in this country for the past two years. She is an operator on a sewing machine. Her family are all nervous, but there is no history of chorea in any other member of the family or in her previous history. Three months previous to examination she had pains in the arms and legs. There was no swelling; no other evidences of rheumatism. Two months ago she began to drop articles while handling them. Then twitchings developed in the arms, and now affected all four extremities and the neck muscles. The movements were the typical irregular choreic movements. There were no choreic movements of the tongue or diaphragm. She stated, however, that the tongue feels so large that she nearly bites it in attempting to talk. The knee-jerks were only present by reënforcement. There were no stigmata of hysteria. Menstruation began eighteen months ago and has been regular ever since. The case cleared up rapidly under Fowler's solution, and no movements have been present for the past month.

Three undoubted cases of chorea, developing after puberty and presenting the same clinical picture, running the same course, were benefited by the same treatment carried out in the disease of childhood called Sydenham's chorea. In none of the three cases was there present at any time "a local and habitual convulsive movement, a contraction of certain muscles, particularly those of the face" (Litre's definition, quoted by Osler: Chorea, etc.), commonly called "tic." As Charcot states in his Lecons du Mardi, 1888–89: "Sans doute, nosographiquement, les tic et la Choree represent bien . . . deux affections radiclement distinctes." If these cases here reported are not cases of Sydenham's chorea, then we will have to consider them as being another and distinct type of disease, because they assuredly are not tic, nor are they hysteria, as that disease is usually understood. It is true that in the second case there were certain associated symptoms of a hysterical nature, but then such symptoms are so frequently met with in true types of chorea in childhood that they rarely if ever throw any doubt upon the diagnosis.

The first case is of interest because of the associated false pregnancy. Chorea in the adult is very prone to occur in females pregnant for the first time, and frequently in those illegitimately pregnant, probably on account of the worry and mental stress associated with such conditions. When the chorea developed in

this woman it created a doubt in my mind as to the correctness of my diagnosis of a false pregnancy. The prognosis in such cases is graver, because the chorea runs a very severe course, and not infrequently either leads to the death of the mother or demands the premature removal of the child. The disease in this woman ran a favorable course. I was concerned during the course of the true pregnancy with the possibility of the return of the chorea. There was, however, no trace of a choreic movement nor any evidence of hysteria during that period. This I think is sufficient evidence that the choreic attack was not hysterical in its nature.

The second case is of interest on account of the patient belonging to the negro race. Chorea, as has been shown by the investigations of Weir Mitchell, Sinkler, and Osler, is rare in the colored race. Sinkler has seen one case in a full-blooded negro. Of 544 cases recorded by Osler, from the Philadelphia Infirmary for Nervous Diseases, not a single negro of full blood can be found. He has, however, reported five cases among the 175 from the Johns Hopkins Hospital.

The treatment of chorea, whether it occurs in a child or adult, is practically the same. The best results are undoubtedly secured by rest in bed and seclusion until the movements have disappeared. This is of more importance in the adult, especially in women, than in children, because these young women are conscious of their ridiculous appearance, and the movements are aggravated by worry. Even when this is not the case the rest favorably influences the course of the disease. A light, nutritious diet with milk and eggs should be given, and every effort made to build up the general tone. Tea and coffee should be excluded from the diet. Any of the alterative and tonic drugs are of value; arsenic in the form of Fowler's solution is most frequently given, and usually with good results—three drops in a child, gradually increased by drop doses until fifteen is reached, less if gastric derangement or puffiness of the lids occur. Patients taking arsenic over any length of time should be carefully watched, as arsenical neuritis may occur after prolonged administration of this drug for chorea. I have seen a very extensive herpes zoster of the trunk from small doses. The bromides and chloral are sometimes of value when the movements are intense, or where the patient is restless, fretful, and sleepless. Trional, acetanilid, and quinine are also used. Donovan's solution (liquor arsenii et hydrargyri iodidi) is a useful drug, but requires careful attention in its administration. The iron preparations are valuable in anemic patients. The bromide of iron, beginning with

five grains and rapidly increased to twenty grains, gives good results in such cases. Bathing is an important element in the treatment of the severe cases. The soothing influence of a warm bath upon the movements is sometimes marked. The wet pack is also of considerable value. Many mild cases which have persisted in spite of Fowler's solution yield readily when the child is compelled to remain in bed twelve hours during the night, and to lie down for at least two hours during the afternoon, with the minor regulations of the diet above noted.

HYSTERIA IN THE MALE.

BY JOHN H. W. RHEIN, M.D.,

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Case 1.—W. H. L——, aged 27, a native of Ireland, married, applied to the clinic for nervous diseases at the St. Agnes Hospital, complaining of a trembling and weakness of the legs. The trouble began in September, 1896, and resulted from the following accident: While engaged in cleaning out a benzine tank, he became weak, had a "sinking spell," and heard "singing in his ears." He was obliged to call for assistance, with which he succeeded in getting out of the tank. He found that he had had an involuntary movement of the bowels, and was so chilly as to require hot-water bags and hot blankets. He recovered sufficiently in a few hours to return to his work. On his way home in the morning (he was a night workman) he had three or four liquid movements, and his urine was passed involuntarily. He further noticed that the left hand trembled and felt "weak and numb." In a short time the left arm was similarly affected, and the trembling rapidly extended to all four members and the head.

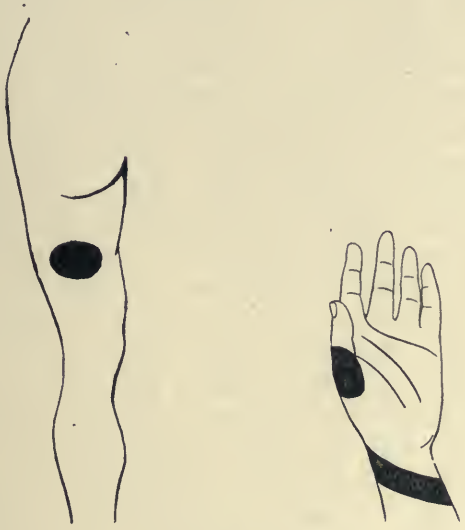
The patient had held the position of fireman and engineer almost all his life; but in 1886 he entered upon the work of cleaning out benzine tanks, at which occupation he had been engaged about three months when he suffered the accident above described. His family history was negative. He was healthy until nine years of age, when he fell, striking his head. A general convulsion followed this, from which he shortly recovered—but ever since these have recurred at varying intervals. The attacks were always preceded by an aura, consisting of cramps of the masseter muscle, pain over the right eye and in the right occiput, lasting sometimes two days. Consciousness was always lost, and the convulsion lasted fifteen minutes, after which he slept. He had never bitten his tongue. There is no specific history; his habits have always been good. He has had three children, of whom two were well; one died from traumatism in childhood.

An examination revealed the following condition: There is a general tremor involving especially the arms and legs. The tremor is coarse and rhythmical, often though not always increased by voluntary effort. It is especially marked when he walks, resembling the tremor of disseminated sclerosis, though differing from it in that

it is not always increased by voluntary effort. There is no loss of power anywhere, though the muscles of the leg are moderately feeble. His general strength, however, is good. He is able to carry a bag of potatoes upon his back or a barrel of flour in his arms. The left leg is distinctly spastic, almost "lead-pipe." His gait is slightly spastic, especially on the left side.

The reflexes are everywhere increased. The knee-jerks are excessive and spastic, but equal on both sides. There is a distinct clonus on the right side, while on the left it is easily exhausted. The cremasteric, abdominal, and plantar reflexes are present.

There is slight sensory change in the arms and legs and in the left hand. In a small area over the thenar eminence, and on the flexor surface of the forearm, sensation is impaired slightly to touch and pain. In the legs there is an area at the junction of the upper and middle thirds on both sides where sensation is impaired slightly to touch, heat, cold, and markedly to pain (see diagram). Muscle sense is everywhere normal. There is no trophic change demonstrable anywhere.



Romberg's symptom is absent, and the nerve trunks are not sensitive to pressure. The pupils respond normally to light and in accommodation. No change in the fields could be found, the eye examination being normal in every way. There is no involvement of the sphincters. His general condition is fairly good, although he is generally thin and anemic. The heart and lungs are normal.

The tension in the radial pulse is very high. His mental condition has suffered but little, though there is some impairment of the memory.

He has been repeatedly hypnotized by Dr. McCarthy and myself. After looking at the finger held close to his eyes there soon developed a spasmodic strabismus evidently hysterical, then irregular twitchings of the face with the appearance of risus sardonicus, and finally a general irregular convulsion. It was possible to induce the somnolent stage of hypnotism. Under suggestion the excessive knee-jerks, clonus, and tremor all disappeared, and in a short time the patient entirely recovered. The segmental anesthesia, the peculiar tremor developing on walking, often absent during rest, which allowed at times his using a needle and thread; the spastic, almost dramatic walk so often seen in hysteria; the spasmodic strabismus, a rare hysterical manifestation, with irregular convulsions developing when he looks at a finger held close to the eyes; the hypnotic state; the total disappearance of all symptoms under suggestion—all point clearly to a diagnosis of hysteria.

Case 2.—The patient, Geo. L——, was 33 years of age, single, and white. His father had succumbed to an accident, and his mother was living and well. He was moderate in the use of alcohol, drank excessive amounts of tea and coffee, and smoked and chewed to excess. He complained of a variety of symptoms, principally, however, of bitemporal headache, of numbness in the right hand when attempting to hold an object in it for any length of time, and of poor eyesight. Two months previously, while suffering from a cough, indigestion, and constipation, he was suddenly attacked with what his physician claimed was a "spasm of the nerves." This upon description proved to be a general convulsion which began in the right hand, then involved the left, and finally spread to the trunk and legs. There was "paralysis of the action of the heart," and he alleges that the arms, legs, and face swelled. He was unconscious for an hour and a half. There was some anesthesia at this time, but the exact distribution could not be determined. The pupils were unequal, reacting to light sluggishly. He was confined to his bed for two weeks after the attack on account of general weakness, but no paralysis has remained. Subjectively he complained upon his first examination of shooting pain in the arms, and when sitting for any length of time of a sensation as if his whole body were asleep.

There was a loss of sensation to pain all over the body, with the exception of the scalp to the hair line, two spots on the anterior

surface of the legs, plantar surface of the feet, and two spots on the left calf posteriorly, mid-dorsal region, and one small area over the left deltoid. The mucous membrane of the mouth and eyes was insensitive. There were no thermal changes.

Dermographia was present to a marked degree. His appetite was fair, his bowels constipated, and he slept well. The station was normal, and the gait unaffected. The knee-jerks were normal, ankle clonus absent, biceps jerk present and equal. There was no palsy of the arm, the dynamometer registering 70 on the right and 65 on the left.

These are typical illustrations of male hysteria, both of them convulsive in type, both had anesthetic manifestations, and both occurred in men from the lower social walks who were not subjected to mental strain or nervous shock.

Hysteria is hysteria, whether occurring in men, women, or children. Sex, age, social life, and occupation may modify the symptoms in the individual case, or have special relations with the etiology of the disease, but the classical picture of hysteria remains in its salient symptoms unchanged.

Early observers, following the theory of Hippocrates and Galen, maintained that hysteria was a disease confined entirely to the female sex. Sydenham was among the earliest writers to describe the disease in the male sex. However, it was observed long before this, for we find illustrations of male hysteria in the epidemic of this affection in the middle ages. For example, the Flagellants in 1260 were composed of men, women, and children, and in the Orphan Asylum at Amsterdam (1566) only boys were affected. They were seized with convulsions, they vomited foreign bodies, and spoke an unknown language.

While it occurs in both sexes, it is more frequent in women. Briquet[2] claims that it is twenty times more frequent in women than in men, while Dana[1] states that the proportion is four to one. In my own experience the latter proportion is more nearly the correct one. The disease begins before puberty in a larger proportion of males than of females, according to Gowers.[6]

Heredity plays an important part in the development of hysteria in both sexes. According to Charcot[5] the hereditary influence is greater in the male sex. The parents of hysterical patients are generally neuropathic. Besides imparting a crippled nervous system to their offspring, the home training is usually bad. The educational factor is a potent one. Habits of self-control are neglected, and false ideas of the proper social relations to others result. This

added to overindulgence and expressions of false sympathy unfits the child to fight successfully the battles of life.

Male hysteria occurs perhaps with more frequency in the lower classes than female hysteria, due probably to the fact that men in this class are exposed more than women to the influence of injuries and alcoholism, the latter of which, according to Charcot and others, is a frequent cause of hysteria. Spermatorrhea, according to Jannet,[7] causes this disease, to which, however, we must not attribute too much weight.

Occupation has a distinct causative relation. For example, among sailors who brave the dangers of the sea, and live upon poor diet, the disease is common. Poets and musicians are frequent sufferers; indeed, any profession of a sedentary character predisposes to this affection.

Federoff[8] states that while trauma in man is a most frequent exciting cause, on the contrary, in women, causes of a psychical nature predominate. Sexual excesses have a distinct influence upon the development of hysteria, and this probably is greater in men than in women.

The symptoms of hysteria vary but little in the two sexes. Oppenheim believes that the convulsive seizures are more apt to be permanent in the male, and according to Federoff the motor disturbances are more frequent in this sex.

The sensory changes are said to be rare in men, and when present, to be found more frequently on the left side. However, Lucas-Championniere, who has studied hysteria largely in Algeria, concluded that sensory changes are equally frequent in both sexes.

Mental changes are always present in this disease; in fact, at one time it was described under the head of hypochondria. While religious delirium and periods of ecstasy are more rare in men than in women (Federoff), on the other hand melancholia is more frequent among men (Oppenheim).

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BOOK REVIEWS.

THE PERVERTS. By Dr. W. Lee Howard. New York: G. W. Dillingham, 1902.

This realistic psychologic novel with a purpose is dedicated to Edgar Allan Poe, as a "tribute to his genius and in recognition of his struggles with the psychic incubus." Medical authors, of novels with a purpose, evincé an undue tendency to didacticism, moving the current of the story in lumbering fashion. This is the case with Dr. W. A. Hammond's "Lal," "Dr. Grattan," etc. It also permeates Dr. Mayo's "Never Again." It likewise impedes Drs. Weir Mitchell and Conan Doyle in their romances, which are not novels with a purpose. Dr. Oliver Wendell Holmes escapes this defect from his rare power as a litterateur, and because he was not unduly weighted by his sense of responsibility as a physician. Dr. Smollett also avoids the lumbering element by relieving it with coarse humor.

Despite didacticism, despite subordination of romance to realism, despite undue use of neo-Latinisms, Dr. Howard has produced a strong story, with considerable movement. His diadacticism naturally glides into the current of the story, and herein he evinces considerable literary skill. This is the more remarkable, as Dr. Howard has the Southern undue proclivity for adjectives. The proverb that "the adjective is the most deadly enemy of the substantive" never obtained south of Mason and Dixon's line, whence the florid diction of that section. The prominent figures of "The Perverts" (better entitled "The Degenerates") are a dipsomaniac of the altruistic type (the hero of the story) and a hysteric invert (who combines the hysteria of St. Theresa with the algophily of the Abbess of Chelles (prototype of Diderot's "Religeuse"), of the Marquis de Sade, and of the Marquise de Brinvilliers). This being persecutes, with keen malignant enjoyment of pain inflicted, her brother, her two sisters, and her mother. One of the sisters (a nymphomaniac hysteriac) becomes a morphinomaniac, and acquires a megalomaniac delusional state. After being lured almost into the gutter by her sister, she disappears into an insane hospital. The dipsomaniac brother finally conquers his morbid tendency by recognizing it as the offspring of nerve instability and autointoxication.

The author not inaptly compares dipsomania to psychic epilepsy, drawing a clear distinction between it and drunkenness. There is nothing innately improbable or strained in the story, not even the attempt to revive the orgies of the flagellants. Dr. Howard assumes that degeneracy aided by higher education of woman more frequently occurs among the relatively sterile Yankee than the fecund Southerner. Here he has been unduly influenced by his environment. The American sexual invert homicides were committed by Southern women: the first by Hattie Deuel, of Pocomoke, Md.; the other by Alice Mitchell, of Memphis, Tenn. Such teachings are in the teeth of biology, since offspring decrease always occurs with a rise in evolution.

Lombroso's doctrines are embraced to the full. In his desire to enhance these, Dr. Howard ignores the lesson he teaches in the Hawaiian-American heroine of the story, that superior maternity may overcome inferior paternity.

The deficiencies of Napoleon's son were due to Hapsburg degeneracy, not Napoleonic neurasthenia. The deficiencies of Goethe's sons were notoriously due to the dipsomaniac Christina Vulpius, their mother. Dr. Howard, failing to demarcate between religion and religiosity, displays, like the early American alienist Brigham, a decided disbelief in religion as an ethical factor.

The book well deserves perusal. Although it does not display the grace of Gautier's "Mlle. Maupin," it is truer to fact. The story may be well compared with the great hysteric stories of Diderot, Flaubert, Zola, Daudet, De Goncourt, and De la Forêt, in which the morphine element is predominant. Should Dr. Howard write fiction again (his present effort gives encouragement that he may with success), it is to be hoped that he will abandon the undue use of the adjective, and of neo-Latinisms. To this end a study of Poe can be recommended. The book is issued with a lurid bar sinister for decoration, not inapt, however, for a book dealing with the illegitimates of evolution.

TEXT-BOOK OF PHARMACOLOGY. By Torald Solmann, M.D. Price, $3.75. Philadelphia and London: W. B. Saunders & Co. 1901.

In the title-page the writer says that he has included in this text-book of pharmacology some of the allied sciences, therapeutics, materia medica, pharmacy, prescription writing, and toxicology. The writer says the subject of therapeutics has always been famous for the difficulty introduced into its study by the multiplicity of details. In studying therapeutics from a pharmacological standpoint we can arrange the numerous drugs into a few groups, which are distinguished by their typical actions, which are varied only quantitatively in individual members. The advantage of studying therapeutics and allied pharmacology can hardly be overaccented. To treat the subject apart from its practical application makes the latter difficult; the joining of the two is a logical arrangement. His object in preparing this text-book is to combine in a systematic and logical manner the subjects of pharmacology and therapeutics.

The work is divided into four parts: the first deals with the preparation and prescribing of medicines and toxicological analysis. Pharmacognosy is defined as that branch of science which treats of the physical and chemical character of drugs. Then follows a description of plants, after which the preparation and compounding of drugs is taken up. Then follows a description of pharmaceutic methods and preparations. This portion of the work is closed with an outline of toxicology and prescription writing.

Part II, dealing with pharmacology, therapeutics, and materia medica, divides drugs into two groups, which separates this part of the work into two sections: (*a*) Drugs whose main action occurs after absorption; (*b*) drugs whose main action is a local one. In former reviews of works of a similar sort we have referred to the difficulty of classifying drugs, but it remains for the latest work to place them in two groups, which would seem to be little aid to the memory. The arrangement followed by the writer commends itself. Each section is divided into a number of chapters, which include a certain group of drugs; thus those in what are spoken of as the convulsant series include strychnine and caffeine, together with picrotoxin and allied substances. Chapter X deals with the cocaine group, while the following chapter discusses the action of drugs upon the heart, the innervation of the heart and its methods of study. Another deals with the internal secretions, among which we have suprarenals,

thyroid, pituitary body, thymus, pancreas, phloridzin, kidneys, and sexual glands.

In the second section drugs which act mainly from their local application are described; there are included soluble salts, acids and alkalies, and the metallic salts.

The work closes with some practical exercises in chemistry, an introduction to experiments upon animals, together with a method of analyzing pharmacologic action. The work should certainly be well received by the profession, as it is a distinct contribution to the scientific therapeutics, a subject sadly in need of extension.

AMERICAN EDITION OF NOTHNAGEL'S ENCYCLOPEDIA. Variola, Vaccination, Varicella, Cholera, Erysipelas, Whooping-cough, and Hay-fever. By H. Immermann, Th. Von Jorgensen, C. Liebermeister, H. Lenhartz, G. Sticker. Edited with Additions by John W. Moore, M.D., F.R.C.P. Authorized Translation from the German, under the Editorial Supervision of Alfred Stengel, M.D. Price, $5.00. Philadelphia and London: W. B. Saunders & Co. 1902.

Those who are familiar with Nothnagel's Encyclopedia will welcome an American translation. It belongs to the composite works composed of numerous monographs, which in their completeness leave little to be desired.

The first two of these, on smallpox and vaccination, are from the pen of Dr. Immermann, of Basel. In discussing smallpox, but a brief historical account of the disease is given, as the writer well says that a mere enumeration of the articles that have been written upon it would fill an entire book. Smallpox reached the highest point of its distribution and intensity in Europe in the eighteenth century. No part of the then civilized world was for any time free from pestilence, and with the gradual withdrawal of bubonic plague, smallpox became the dominant pandemic in the fullest sense of the word. In England it caused one-tenth of the total mortality. Jenner's discovery is said to be the greatest sanitary fact of all times, and not the less so because in individual cases intentional vaccination had been practiced before.

In discussing the spread of the disorder, the writer says that the pock contents are volatile, and by means of effluvia from the patient mingle mechanically with the surrounding atmosphere, infecting the air at a distance. Such conclusions rest largely upon the few facts that have been gathered regarding the distribution of the disease and upon the *ex cathedra* utterances of old writers. The recent advances in parasitology, particularly the identification of malaria and yellow fever, teach us that contact infection is practically the only means of spreading germ diseases. While the specific organism of smallpox has not been identified, that it is dependent upon a bacterium is now generally believed. When such germ has been identified, it is more than probable that some such definite means as an animal parasite, water or food, may be found to convey it from person to person. There is an excellent article upon the inoculation of human smallpox, and an exhaustive discussion, historical and practical, of vaccination in man. The statistics presented by the writer ought forever to set at rest the antivaccination movement.

Von Jorgensen devotes twenty pages to the description of chicken-pox, in which there is a discussion of the duality of smallpox and chicken-pox.

Asiatic cholera and cholera nostras is discussed by Liebermeister. He

definitely decides against the contagiousness of cholera. Contact with cholera patients is only slightly dangerous, and the disease does not spread from person to person. It is stated that all of the difficulties in relation to the spread of cholera are met by the assumption that the cholera bacillus has two necessary stages in its life history, one within and one without the body.

The work closes with a brief account of erysipelas, whooping-cough, and summer catarrh. The American edition of Nothnagel's encyclopedia is an excellent reproduction of the original, and with a few notable exceptions the translating has been well done. Sometimes the peculiarities of the German text have been too closely followed, and consequently the English is not as readable as it otherwise might have been.

MODERN OBSTETRICS, GENERAL AND OPERATIVE. By W. A. Newman Dorland, A.M., M.D. Second Edition, Revised and Enlarged. Philadelphia and London: W. B. Saunders & Co. 1901.

The first edition of Dorland's Obstetrics appeared in 1896, and it immediately took high rank as a practical text-book in the instruction of undergraduates. In it an elective system was followed which included the presentation of the subject from the clinical, physiological, and pathological standpoint. There is first a complete description of normal pregnancy and labor, from its beginning to the time when the child is weaned. Then follows, in natural order, pathological pregnancy, beginning with first a description of the diseases of the ovum, fetal appendages, and the fetus. This is followed by a chapter on the general pathology of pregnancy. Then in respective order the pathology of the puerperium and of the new-born. In the second edition a number of additions have been made, including chapters on the surgical treatment of puerperal sepsis, infant mortality, placental transmission of disease, the serum therapy of puerperal sepsis, and the rôle of the liver in the production of puerperal eclampsia.

In considering the liver as the possible starting-point of eclampsia, the writer refers to the fact that there is a strong reaction against the old established theory that renal inadequacy, as shown by albuminuria, is the sole cause of this condition. The prevailing theory regards the disease as a toxemia of unknown origin. The numerous changes found post mortem in the liver in these cases suggest that some disturbance of the metabolic functions in this large gland may be the cause of the disease. The theory is concisely stated by Pinard: "We must admit that, independently of all previous diseases, there is a kind of hepato-toxemia that is peculiar to pregnancy, and a certain share of the accidents and complications thereof depend directly upon the condition of the liver." The kidney has only a secondary, although sometimes a very important, relation, while albuminuria is more of a habit than a complication, or it may even be and often is a sign of hepatic insufficiency. Among the causes of the condition are old hepatic disorders, a sedentary life, tight lacing, a warm climate, and arthritism.

In the treatment of puerperal sepsis prophylaxis is said to be all-important. The latter is to be attained by thorough asepsis of the parturient and her surroundings. The vaginal douche in normal labors and healthy patients is unnecessary. In only those cases in which dystocia is present, or where obstetrical operations are necessary, are douches indicated. When the disease has developed, the indications are to remove the source of infection. Every effort

should be made to make the external parts, as well as the vagina and uterine cavity, aseptic. The indications for curettement are two: Those in which it is evident that placental membranes or masses are retained, and those in which, after a normal labor, the lochia are fetid. The medicinal treatment advocated by the writer consists of the administration of the appropriate serum when the germ can be identified. Saline transfusion is to be used to fill the blood-vessels and favor elimination, while nuclein is employed to increase the production of leucocytes and aid the phagocytic action of the blood.

A System of Physiologic Therapeutics. Edited by S. S. Cohen, A.M., M.D. Philadelphia: P. Blakiston's Son & Co. 1902.

This system of therapeutics, of which the first four volumes have been issued, is to consist of eleven books. It is intended to be a practical exposition of the methods other than drug-giving which are useful in the treatment of disease.

The first two volumes are on electrotherapy, by George W. Jacoby, M.D.; Book I deals with electrophysics and contains 163 illustrations. It contains an account of the apparatus required for the therapeutic and diagnostic use of electricity.

Book II deals with the diagnosis and therapeutic applications of electricity, and includes special articles on electricity in diseases of the eye, by Edward Jackson; in diseases of the throat, nose, and ear, by William Scheppegrell; in general surgery, by J. C. Da Costa; in gynecology, by F. H. Martin; in diseases of the skin, by A. H. Ohmann-Dumesnil.

Books III and IV deal with climatology, including health resorts and mineral springs. They have been prepared by F. P. Weber with the collaboration for America of Guy Hinsdale. The first book deals with the principles of climatotherapy, ocean voyages, and Mediterranean, European, and British health resorts. The volumes dealing with climate are more than a mere catalogue of the various health resorts, but there is a study of climate as it may be utilized in the recovery of the sick and prevent the development of disease. The two volumes upon climatology present the best statement of the subject to be found in the English language. Taking these four volumes as an index of what the completed series will be, it is evident that the system of physiologic therapeutics will be a striking addition to the literature of medicine. It shows the advances which have been made in the treatment of disease other than by drugs. As such, it cannot fail to be of immense importance.

The Practical Medicine Series of Year-books. Under the General Editorial Charge of Gustavus P. Head, M.D. Volume III: The Eye, Ear, Nose, and Throat. Edited by Casey A. Wood, M.D., Albert H. Andrews, M.D., and T. Melville Hardie, A.M., M.D. Chicago: The Year-book Publishers. 1901.

The first portion of the volume deals with the eye, under charge of Dr. Wood. He tells us that it has been found impossible to present in an effective way a condensation of all the meritorious articles that have appeared within the year. In making the selection, the intention has been not to deal exclusively with matters that interest the specialist, but to include certain articles of benefit to the general reader showing the relation of ophthalmology to extra-

ocular diseases. There is a brief review of the recent contributions to the anatomy, physiology, and hygiene of the eye, together with a description of the late contributions to ocular pathology. The section on ocular therapy is especially full.

Dr. Andrews contributes the section on diseases of the ear, the most important part of which is that dealing with mastoid disease, sinus thrombosis, and cerebral abscess.

Dr. Hardie contributes the section on the nose and throat, in which the more important division is that dealing with the pathology of the accessory cavities.

The book is bound uniform with the first two volumes, and furnishes an excellent *résumé* of the recent contributions in this department.

AMERICAN TEXT-BOOK OF PATHOLOGY. By Ludvig Hektoen, M.D., and David Riesman, M.D. Price, $7.50. Philadelphia and London: W. B. Saunders & Co. 1901.

We shall not attempt an extended review of the American Text-book of Pathology, as it is one of the largest single works that has recently been issued from the American press. It contains 1245 pages, and forms a bulky and somewhat unhandy volume which it would have been wise for the publishers to have bound in two volumes. This would have made it less fatiguing to hold and would have materially contributed to the life of the work; such heavy books, with a comparatively light binding, soon become racked.

Nineteen of the leading pathologists in the United States have contributed to this volume. It is divided into two parts, the first dealing with general pathology, to which an introduction has been written by Lewellys F. Barker. Articles upon special pathology have been contributed by specialists of the particular line. Like composite works of this kind, of which numerous examples have issued from the American press, it is a series of monographs which by careful editing is made to cover the entire field of human pathology. There are some repetitions and omissions, as unavoidably occurs in a work of this character, but on the whole it is one of the most imposing additions to the literature of pathology that has appeared in recent years, and is a credit to American pathologic research.

"FIRST AID" TO THE INJURED AND SICK. By F. W. Warwick, B.A., M.D., and A. C. Tunstall, M.D., F.R.C.S. Price, $1.00. Philadelphia and London: W. B. Saunders & Co. 1901.

The title of this work shows its contents. It is a small volume of 232 pages, containing many illustrations, and deals with the methods of arresting hemorrhage, applying bandages, and generally making the injured and sick comfortable while they are being carried to the ambulance, and from the ambulance to the hospital. Various forms of stretchers, the method of lifting patients, together with such an anatomical description as will enable the non-medical person to profit by the work, are included in its contents.

The arrangement of the work consists first in a description of the application of bandages; then follows, in order, immediate treatment of hemorrhage, wounds, dislocations, fractures, asphyxia, poisoning, insensibility, and burns. Lastly follows the transport of the sick and injured, and finally the preparation for the reception of a case of accident or sudden illness.

LEADING ARTICLES.

A NEW THEORY OF THE PATHOGENESIS OF TETANUS.[1]

An analysis of the symptomatology of tetanus discovers two groups of leading symptoms: the first consisting of gradual contraction or stiffness of all the muscles; the second a later developed, general muscular jerking proceeding from the central nervous system, adding to the already contracted muscles a still greater rigidity. In spontaneous tetanus the spasms first affect the muscles of the lower jaw, then those of the neck, back, and upper extremities, finally those of the lower extremities. In experimental tetanus, on the contrary, they begin at the seat of infection and spread equally in all directions.

Not long ago Zupnik was able to produce tetanus, corresponding to the spontaneous form, by experimental inoculation of the subcutaneous tissue, and we can to-day, without difficulty, upon one and the same animal with the same infectious material, successfully produce descending tetanus (similar to the spontaneous disease) as well as the already long known ascending tetanus. The investigation which elucidates the occurrence of both of these forms of intoxication, with regard to the point of action of the tetanus toxin, has been undertaken during the last two years at the suggestion of Professor Pohl, and has resulted in a series of facts which seem to alter the views of the pathogenesis of tetanus accepted at present.

The facts force us to the conclusion that tetanus toxin possesses a specific affinity for the muscular tissue. The facts are as follows:

1. *Tetanus descendens* can be experimentally produced by spontaneous inoculation, when the infectious material is introduced into a muscle-free area. The fact that in subcutaneous infection of the limb, and in almost every case of spontaneous tetanus, the infectious material fails to stand in relation to the muscular tissues, so that tetanus descendens occurs, is incompatible with the idea that the poison reaches the spinal cord by way of the peripheral nerves.

2. In spontaneous tetanus, the local contraction of the muscles occurs only if the injury affects the muscle or extends into it.

3. The clinical picture of experimental ascending tetanus depends upon the seat of infection; for example, by inoculation of the posterior extremities one observes rigidity, sometimes of one, sometimes

[1] From a paper, "Ueber den Angriffspunkt des Tetanusgiftes," by Dr. L. Zupnik (*Wiener klinische Wochenschrift*, Jan. 23, 1902). Edited Translation.

of both, hind legs. This depends in part upon the proximity of the seat of inoculation to the root of the tail, or the inguinal fold. In this way an experimental, one-sided, ascending contraction may be brought about, which is then limited to one-half of the body. This peculiar unilateral rigidity is also observed in spontaneous tetanus, the variability of the picture not being explainable by the effect of the poison on the spinal cord. Otherwise one would be involuntarily forced to the conclusion that the poison had at one time extended longitudinally and another time transversely through the spinal cord.

4. The tonic muscular contractions do not yield to narcosis, or section of the related nerve of the member, nor to the influence of curara.

5. The most serious peripheral injection is into the muscular tissues. The same dose that produces fatal tetanus by intravenous injection is also fatal when injected into the muscles. Larger doses are necessary to produce death by subcutaneous than by intramuscular injections of the poison into animals of equal weight.

6. The duration of the incubation period increases with the same dose of poison, in animals of the same weight, according to the manner in which they are injected—that is, whether into the subcutaneous tissue or into a muscle. This fact forces us to conclude that a specific relation exists between tetanus toxin and muscular tissue, though we are left in doubt as to whether the actual contractile substance or the motor end-plates are involved. This affinity, however, can only take place through the normal metabolic processes of the muscle, or, to speak more accurately, only when the muscle and its related ganglion cells are in this normal relationship. This is shown by the following:

(*a*) Section of the posterior roots remains without influence upon the course and progress of the intoxication.

(*b*) One-half section of the lumbar cord does not hinder the course of local tetanus.

(*c*) Section of the peripheral nerves makes inactive a dose of poison certainly fatal when injected above a muscle.

Zupnik is thus led to believe that the failure of tetanic spasms under these conditions serves to show that a large part of the toxin injected into the subcutaneous connective tissue and probably into the muscles is retained and does not enter the general circulation; that the metabolism of the muscles behaves abnormally in consequence of the existing abnormal innervation and disturbance of the circulation, so that the injected poison is for a long time held back

and becomes inactive. This view, which he hopes to demonstrate by experiment, is supported by the following:

(*d*) If one inject about twice the least fatal dose into a muscle whose nerve is severed, the enervated muscle remains flaccid, while neighboring normally innervated muscles become rigid and a fatal ascending tetanus develops. The absorption of the poison could only have taken place, in this case, through the connective tissue or the muscle.

(*e*) Animals whose sciatic nerves are cut endure without harm a dose of toxin fatal for normal individuals if the injection be given into the subcutaneous tissue, but die with the symptoms described in paragraph (*d*) if the same dose of poison be injected into the enervated muscle.

From these facts he concludes that the first chief symptom of tetanus, the muscular rigidity, owes its existence to a specific combination of the toxin with normally innervated muscle tissue.

Further experiments showed the influence of the nervous system upon the symptom-complex of tetanus. Intracerebral toxin injections were made in dogs, cats, and rabbits. As a constant sequence, epileptoid paroxysms were observed. In none of these experiments were symptoms bearing the remotest resemblance to traumatic tetanus observed. Zupnik believes, therefore, with Brunner that the tetanus toxin both in spontaneous and experimental tetanus leaves the brain itself intact, and that the brain plays no part in the pathogenesis of tetanus.

Professor Myer says, as a result of his experiments, it is definitely shown that the tetanus poison reaches the ganglion cells of the central nervous system only by way of the peripheral nerves; and further, that it is once for all demonstrated that tetanus occurs only through its central action, with the exclusion of every peripheral affection. These conclusions Myer bases upon the following five considerations:

1. The poison which has been injected into the subcutaneous tissue is demonstrable in the nerves. Our experiments, which were performed exactly according to Myer's methods, gave different conclusions, as follows: (*a*) That the connective tissue had the peculiarity of retaining the tetanus toxin for weeks at a time. (*b*) That the poison extends very slowly in all directions from the point of infection, so that the ascending tetanus radiates in all directions. That the toxin can be found in the connective tissue of the peripheral nerves is probable, though one can find incomparably more of it in the connective tissue remote from the nervous trunk.

2. Toxin injections in the peripheral nerves operate more rapidly and readily than subcutaneous inoculations.

Two experiments made with sublethal doses of poison upon dogs showed Zupnik no difference between the experiment and control animals. Two other experiments with minimal fatal doses gave the same results. He cannot, therefore, support Myer's view. Numerous other experiments showed that when the poison is injected into a nerve trunk it distributes exactly as when injected into the subcutaneous tissue.

3. The injection of antitoxin into the peripheral nerves is followed by destruction of the poison and the animal remains well. The three experiments which Myer mentions speak against this view, according to Zupnik's interpretation. In the first two experiments no precautions were exerted to prevent the escape of the toxin from the nerves, and the extremities remained without any tetanic symptoms. In the third the puncture of entrance was immediately closed, so that the antitoxin had difficulty in escaping. This animal showed tetanus of the same extremities after seven days.

4. Myer's conception that the antitoxin is not in a condition to find its way either into the peripheral nerves or into the ganglion cells of the central nervous system can be easily overthrown, if one select such unfavorable conditions for its action as intracerebral injection of toxin shortly followed by intravenous injection of antitoxin. Under these conditions dogs remain without symptoms, while control animals die with the so-called cerebral tetanus.

5. Injection of tetanus toxin in the spinal cord produces a peripheral tetanus with a much shortened period of incubation. Myer injected 0.2 cubic centimeter of a very strong solution of toxin into the lumbar spinal cord of a cat, and in three hours observed stiffness of the corresponding extremities. A peripheral distribution of the poison is, according to his view, entirely excluded by the short period of time. Zupnik, however, repeated Myer's experiment in the same way, killing the cat in exactly three hours. The sciatic nerves of both sides were dissected out, emulsified, and injected into mice. A mouse treated with an emulsion from the nerve of the left side died of tetanus in four days, while one receiving an emulsion from the other side showed almost no signs of intoxication. It is, therefore, demonstrable that the injection of the toxin into the spinal cord is followed by its escape along the peripheral nerves in a very short time. Concerning the rigidity which Myer observed to develop in three hours, Zupnik made experiments upon thirteen cats, in not one of which did this symptom develop in the given

time. The earliest period of its occurrence was fourteen hours, and then only under certain conditions which will be considered later on.

In Gumprecht's experiments upon guinea-pigs, to which Myer also refers, local symptoms appeared five days after the injection of the toxin in the spinal cord.

Ransom injected antitoxin into the spinal cords of two rabbits, a guinea-pig, and a dog, with results contrary to those of Myer. According to these observations, Myer's idea, that of the extension of the poison by way of the peripheral nerves and its central point, cannot be regarded as correct.

Zupnik closes this part of his contribution with the remark that muscular rigidity must always depend upon the local presence of the tetanus toxin.

The spinal cord experiments already quoted consist of injections in the lumbar cord, and have given the following results:

1. The minimal fatal dose of poison injected into the spinal cord is about one-fifteenth of the dose required to produce death when injected into the subcutaneous or muscular tissue.

2. If one inject a quantity of poison approximating the fatal spinal cord dose, a very peculiar intoxication picture develops, which Zupnik calls "spinal tetanus." In about fifteen or twenty hours an increased reflex excitability of the corresponding posterior extremity is observed, shortly followed by reflex contractions lasting a second at a time. After a definite length of time the same appearances present themselves in the other posterior extremity, and finally in the anterior extremities. A gentle touch or a loud noise made at this time may produce clonic spasms of the spinal column and all four extremities at once. These general convulsions occur spontaneously from time to time. At the height of the disease general paralysis occurs. There is no sign of trismus or opisthotonos. In a word every indication of tonic muscular rigidity is absent. It is a picture which brings to mind the second general symptom of tetanus—that is, the *general clonic spasms*. From these facts Zupnik concludes that the tetanus toxin affects first the central nervous system, and perhaps exclusively the spinal cord; and further, that from this affection nothing else results than an increased reflex irritability and general clonic spasms.

3. Quantities of poison which are not so large, but which represent several times the fatal spinal cord dose, produce a mixed picture, a "tetanus spinalis" accompanied by mild continued spasms of the corresponding extremities. These spasms do not appear before about fourteen hours, and are produced, as has been already

stated, by peripherally present poison. The least dose which produced this picture was one-third, the largest one-sixth, of the subcutaneous minimal fatal dose.

One often observes in animals which have been injected in the spinal cord a violent turning of the head toward one of the hind extremities or tail, the animal not seldom biting itself to the extent of drawing blood. This never follows the intracerebral injection, and does not occur where section of the posterior roots is made after the toxin injection, so that it probably expresses a marked sensory irritation. It is further to be remarked that large quantities of poison act paralytically upon the center of the spinal cord.

According to these principles, the pathogenesis of tetanus is as follows:

1. The poisonous principle of tetanus toxin acts through the peripheral organs, upon the muscular tissue, and through the central nervous system only upon the motor ganglion cells of the spinal cord. The union of the poison with the muscle results only in rigidity, the union with the ganglion cells only in reflex irritability and general clonic spasm.

2. Both forms of the tissue receive the poison by way of the blood current.

3. Local tetanus is brought about by direct combination with the poison. The ascending contractions are explained by the conduction of the poison in the muscle substance itself, the connective tissue as it appears only supporting it, inasmuch as it receives the injected poison and holds it for a relative length of time, giving it up slowly to the muscles.

4. The incubation finds its explanation in the necessary time required for the chemical reaction between the poison and the sensitive tissue.

5. The small quantity of the poison that reaches the subarachnoidean space by way of the connective tissue of the peripheral nerves is given up, not to the spinal cord, but to the circulating blood. This result followed the experiments of both Zupnik and Ransom.

6. The poisonous substance itself may be simple and produce two entirely different results through combination with two different tissue elements, or the tetanus toxin may contain two poisonous substances, one of which has a specific affinity for the muscular, and the other a specific affinity for the ganglion cells of the spinal cord. Further experiments, it will be hoped, will settle this point. The experiments suggest a large series of new investigations and open a new point of view from which to regard the treatment of symptomatic tetanus. It would be desirable to find out by direct

intradural injections of substances by which the reflex irritability of the spinal cord is destroyed or increased, how to exclude the general clonic spasms which are most dangerous for the patient. It remains necessary to say a few words about the early symptoms of descending tetanus, which usually begins with trismus, a fact which is incompatible with any of the theories of tetanus thus far suggested. It is commonly supposed to depend upon a specific affinity of the tetanus toxin for the nuclei of the trigeminus nerves. This opinion is, however, inadequate for two reasons: (1) Because a considerable number of cases of descending tetanus first complain of stiffness and contractures in the back, so that such an affinity is absent or replaced by an affinity for the spinal cord; (2) on account of Nysten's law regarding *rigor mortis*. This brings Zupnik to the conclusion that in tetanus descendens, as in rigor mortis, purely mechanical conditions are operative.

A consideration of the anatomical relations of the muscles of the back shows that neither the muscles of mastication nor the erectores spini possess antagonistic groups, through which they can only maintain their equilibrium. Loss of this equilibrium can only be recognized by a disproportion which exists in these muscles in a degree not to be found in any other large muscle group. When one turns from rigor mortis and directs attention to tetanus, it is found that from the seat of injury the poison enters the circulation, from which it is equally distributed to all of the voluntary muscles, in which it slowly accumulates, and with which it chemically combines. Hand in hand with this combination the tone of the muscle increases until as soon as a definite degree of rigidity is attained, the patient first becomes conscious of it where the greatest disproportion of muscular action exists. A certain number of patients, therefore, present trismus, and a certain number opisthotonos, as the first symptom of tetanus.

Zupnik believes that this theory of tetanus is the only one that can explain the total symptom-complex of the disease.

TOBACCO.

To smoke or not to smoke is rapidly being settled by mankind in favor of smoking. The controversy over the evil effects of tobacco began when King James I. penned his royal "counterblast to tobacco." That tobacco is a poison belonging to the narcotic group, no one will deny, but there is a wide difference of opinion in the profession as to what permanent evils the use of the weed may have. It was the opinion of one of our leading clinicians that while there

was a marked and varying idiosyncrasy to tobacco, in the average case it took about twenty years of the enthusiastic addiction to get up a chronic tobacco poisoning in those individuals that were, so to speak, saturated with the drug (we refrain from saying nicotine, because late investigations throw some doubt as to that being the active poisonous principle, particularly where the tobacco is smoked).

The question of tobacco amblyopia seems at the present time to be with some definiteness settled in favor of tobacco, though there are many who believe that alcohol, which is commonly associated in this poisoning, plays an important part in the production. Unquestionably there are pure types of tobacco amblyopia. Tobacco-heart and tobacco-throat are well recognized conditions. Pipe-smoker's cancer of the lip and tongue might with some propriety be classed among the occupational disorders. The evils of tobacco are not many compared with the good which the weed has accomplished. The non-smoker and the antitobacconist would probably write the word "good" in quotation marks to be followed by a large question mark. To those who are addicted to the pipe and the cigar it will not overstate the matter, for they have often experienced the soothing effects upon the mind and brain.

It must be stated that the evils of tobacco depend largely upon the dose. Formerly it was taken in the form of snuff, but that means of employing the weed has largely passed out of use; if it had any special clinical effects different from other forms of ingestion, it was not mentioned by the medical writers in the earlier part of the century, nor has it been referred to by late observers. In the tropics the cigarette is almost exclusively employed, as it is in Russia. The little paper tubes euphoniously termed coffin nails seem to have little destructive effects on the Russians. The casual observer notes the general stalwart appearance of these northmen, and to the Englishman and the American there seems to be something effeminate in the little paper tube filled with tobacco projecting from their bearded lips. The Englishman is a born pipe-smoker, as can be demonstrated at any time by observing the top of a bus in the Strand filled with bank clerks, each with his briar pipe sticking from beneath a silk hat.

The *Lancet*, discussing editorially the use of alcohol and tobacco, says that the toxic symptoms of the latter are much increased by alcoholics. An explanation is sought in the solvent power of alcohol. Both nicotine and pyridine, the latter especially being the poisonous constituent in tobacco smoke, are not readily soluble in

water, but are in alcohol. An alcoholic drink is calculated to wash the poisonous oil from the mouth, and to carry it to the stomach, facilitating its absorption.

Recently two books have been published upon tobacco—one "The Soverane Herbe," by W. A. Penn; the other, "Tobacco in Song and Story," by John Bane. The first of these books is the most complete history of the tobacco plant yet published. Tobacco is not the name of the plant, but was originally applied to the pipe in which it was smoked. The weed was not brought to Europe until 1560, in the time of Philip II., and from Spain it gradually made its way into other countries of Europe. The French envoy to Portugal, Nicot, sent a specimen home, and it is to him we are indebted for the name nicotine.

In the early days of tobacco all sorts of medicinal virtues were attributed to it. It soon came into vogue. First it was smoked in pipes according to the Indian fashion; later, snuff-taking and then chewing became popular, both of these finally yielding to the almost universal habit of smoking. In addition to the active opposition of James I., one of the popes issued a bull against the use of snuff in church. At one time an act of Parliament was proposed to banish tobacco from England. Among those who upheld the virtues of the weed, it was contended that a pipe smoked on an empty stomach on a rainy morning on any day of a month spelled without a letter R was "a singular and sodaine remedie against the megrim, the tooth-ache, the falling sickuesse, the dropsie, the gout, and against all such diseases as are caused of windy, cold, or waterish humours." An impetus was given the use of tobacco following the great plague. It was thought to be a disinfectant and to especially ward off this disorder.

A French traveler in England once reported regarding the use of tobacco: "The supper being finished, they set on the table half a dozen pipes and a pacquet of tobacco for smoking, which is a general custom as well among women as men, who think that without tobacco one cannot live in England, because they say it dissipates the evil humours of the brain. . . . While we were walking about the town, he asked me if it was the custom in France as in England that when the children went to school, they carried in their sachel with their books a pipe of tobacco, which their mother took care to fill early in the morning, it serving them instead of breakfast, and that at the accustomed hour, everyone laid aside his book to light his pipe, the master smoking with them, and teaching them how to hold their pipes and draw in the tobacco."

EDITORIAL COMMENT.

AN INVESTIGATION INTO THE PRESENCE OF INFECTIVE MATERIAL IN DWELLINGS OCCUPIED BY CONSUMPTIVE PERSONS.

Harold Coates, M.D., in the *Therapeutic Monthly* for January, 1902, publishes an investigation concerning the infectiousness of the dust of houses occupied by tuberculous patients. The experiments were conducted at the suggestion and under the direction of Professor Delepine, and covered very much the same ground as those classical investigations Cornet made eleven years ago. The investigation comprehended (1) a study of dusts from houses in a dirty condition, and in which the consumptive patients exercised no precaution to prevent infection of the atmosphere by the expectoration, but spat freely upon the floor or in a pocket-handkerchief, etc.; (2) dusts from houses in a very clean condition, but in which the consumptive patient does not exercise great care concerning the disposal of sputa; (3) dusts from very dirty houses in which there have been no cases of tuberculosis for several years. Specimens of dust were collected from situations in which dust from the atmosphere had settled naturally, and where there would be a likelihood of direct contamination with expectoration or by infected articles. Samples of dust were taken from each house, from the floors, skirting-boards, walls, shelves, mantelpieces, etc. Dust was collected in part by means of a sterilized spatula and in part by a sterilized sponge, which were vigorously rubbed over a wall or other area from which the dust was to be collected. In only two cases out of a very large number of film preparations of the dust examined were tubercle bacilli demonstrable microscopically. This method of study was therefore abandoned for the method of guinea-pig inoculation. The animals were inoculated in the inner aspect of the left leg, just above the level of the knee-joint, this method having been recommended by Professor Delepine, in 1893, as productive of very definite and constant lesions.

Of the houses of Class I—that is, infected houses in a dirty condition—twenty-three were examined, definite results being arrived at in twenty-one cases. Altogether fifty-two guinea-pigs were inoculated, twenty of which died in a few days after inoculation, seventeen were killed four or five weeks after and found to be tuberculous, and fifteen were killed four or five weeks after and found to be healthy.

In sixteen of the houses known to be tuberculous, dust was found to be infectious in thirteen out of thirty samples collected. The greatest infectivity of the dust was that nearest the floor but taken from parts of the room where direct infection could not have taken place.

II. The series of clean but infected houses. Ten houses were examined, two samples of dust being taken from each, and each sample being used to inoculate one guinea-pig. Of seventeen animals which survived death from immediate septicemia, six developed tuberculosis and eleven were found free from the disease at the post-mortem examination. Of the ten rooms examined, dust capable of producing tuberculosis on inoculation into a susceptible animal was found in five; in one case both animals belonging to that room became tuberculous; in the other four rooms one animal only became infected. Thus even in the cleanest of houses infectious dust can be found in 50 per cent of cases when the phthisical occupant is using his pocket-handkerchief or floor for a receptacle for sputum.

III. The series of very dirty houses were exactly similar to those of Class I, except that no consumptive patient had lived in them for some years. Many were badly lighted and ventilated, and in all of them there was plenty of dust, on the walls, the floor, etc. Ten houses were examined, and in no case was tuberculous dust discovered. Twenty guinea-pigs were inoculated with dust taken from these houses, six dying a few days after inoculation from sepsis. The remaining fourteen were killed four or five weeks after infection, and all were found free from tuberculosis.

The experiments almost parallel in their results those of Cornet, and show clearly that live and virulent tubercle bacilli are present in the dust which has deposited itself naturally from the atmosphere in rooms occupied by phthisical patients in the habit of spitting upon the floor or into a pocket-handkerchief. These investigations are extremely important at the present time because of the tendency now prevalent to depart from the inhalation theory of tuberculosis for the gastrointestinal form of infection, and to look upon the disease as being largely caused by ingestion of infected milk. Doubts have recently been thrown upon the work of Cornet, and it seems particularly timely that this confirmation of his work should appear. However true it may be that infection by the tubercle bacillus commonly results from ingestion, we cannot but believe that in an atmosphere polluted by tubercle bacilli to the extent that permits of infection of 50 per cent of the experimental animals, the danger of inhaling tubercle bacilli is great.

A most important practical application suggested by the investigator is the thorough disinfection of every premises previously occupied by tuberculous patients. It is well known that among the poor the death or removal of a patient with tuberculosis is apt to be followed by the immediate entrance into the premises of a new family, the health of whose members may be immediately jeopardized by the infection lurking in the dust. Should health boards adopt energetic measures for the destruction of the infectious elements in these dwellings, much avoidable illness and considerable loss of life might be prevented.

CANCROINE IN THE TREATMENT OF CANCER OF THE ESOPHAGUS.

Cancroine is said to be a microbic poison extracted from cancer juice. Its chemical composition is not defined, but its physiological effects are identical with those of neurine, a toxic base extracted from fresh cadavers. Cancroine or neurine, injected in small doses, exercises a specific action upon cancer and its metastases. It is followed by necrosis of the cancer elements without inflammatory action, the tumor being resorbed.

Cancroine as a remedy for cancer has been exploited by A. Adamkiewicz, of Vienna. The five cases referred to are taken from *La Presse Médicale* of January 22, 1902, and the *Lancet* of February 1, 1902.

In July, 1900, a man 66 years of age noted difficulty in swallowing. Later, emaciation was rapid, and there was considerable pain. Exploration with the sound showed a narrowing of the esophagus which did not permit of the passage of a small bougie. July 20 he received the first injections, and the following day declared that he felt better. The treatment was continued. The cachexia disappeared, and on the sixth day after the beginning of the treatment the patient noticed that he was able to swallow liquids. At this time exploration with a sound showed the opening to be five millimeters in diameter.

A second observation was in a man who had a cancerous narrowing of the esophagus near the cardiac orifice. A few injections of cancroine caused immediate amelioration.

A third observation occurred in a man 60 years of age whose first signs of dysphagia were noted in 1900. The diagnosis of cancerous obstruction was made. Repeated efforts at dilatation were followed by no further results than to increase the suffering of the

patient without functional amelioration. Five injections of cancroine caused all the subjective symptoms to disappear, and the patient was able to eat and drink without difficulty. He recovered his strength rapidly, and fifteen days after the beginning of the treatment the cachexia had disappeared.

The fourth patient was a woman suffering from stenosis of the lower portion of the esophagus. Soon her diet was restricted to liquids, and later she was unable to take these. Sounding revealed the situation of the stricture at 41 centimeters below the dental arch. Under cancroine injections there was rapid improvement. On the sixth day of the treatment both liquids and solids were ingested without difficulty. A slight indisposition led to the interruption of the treatment, followed by a rapid return of the dysphagia. Later, after the patient had returned to her home, the difficulty in swallowing returned and a second series of injections were made, which again caused the trouble to disappear.

There are certain features in the report of the case in the *Lancet* that lead one to think that possibly the patient was afflicted with a disease other than cancer. We quote, in speaking of a partial relapse of the patient: "It was immediately obvious to me that colonies of cancer coccidia, survivals from the previous illness, had subsequently obtained further development, and that the inflammation of the uterus must be due to them. For some reason the injections of cancroine were discontinued; the uterus rapidly enlarged, and the *metritis* is said to have endangered the patient's life. When the injections of cancroine were resumed, the *metritis* gave way and the patient rapidly improved." (Italics ours.)

A study of the cases so far reported, the want of published microscopical findings, or, indeed, of detailed clinical histories, causes us to at least reserve our opinion until adequate evidence is offered, in support of the Vienna physician's contention that he has discovered a remedy for cancer.

THE BLOOD SERUM OF CARCINOMA PATIENTS AS A SOLVENT FOR YEASTS.

Brouha, in the *Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, vol. xxx, No. 25, December 21, 1901, discusses the interesting phenomena that have been recently observed by Bordet, Gengou, Widal, Lambotte, Ehrlich, Malvoz, and others, who have shown that when blood-corpuscles, bacteria, yeasts, etc., are injected into the blood of any animal, its serum develops a

specific substance through which the alexins, normally present in the blood, are able to bring about solutions of the respective injected cells. Seeing that Malvoz had been able to show that the injection of yeast cells was followed by the occurrence of specific antagonistic substances in the blood of the injected animals, Brouha was led to regard it possible that the blood of patients suffering from carcinoma might show the presence of the same specific substance through the absorption from the tumors of yeast cells or their metabolic products, providing the recent view of the etiology of carcinoma—that is, that it depends upon the presence of a yeast (blastomycete)—be correct. If the blood possesses such a power, this power might be made use of as an aid to the diagnosis of carcinoma in difficult cases. On the other hand, if no such power exist in the blood it would lessen the probability that yeasts play any part in the etiology of carcinoma.

Brouha experimented with five different yeasts: one obtained from San Felice, another from Plimmer, a third from Curtis, a fourth from Leopold, all having been collected from different forms of carcinoma, while the remaining culture was that of Saccharomyces ellipsoideus II, of Hansen. The exact technique was as follows: (1st series) In three little tubes mixtures were made containing four drops of a very rich emulsion of the respective yeast to be tested in physiological salt solution; twelve drops of cancer serum heated for one-half hour to 56° C., that its normal alexin might be destroyed, and two drops of normal fresh human serum. (2d series) This mixture was the same except that the cancer serum was replaced by the same proportion of normal heated human serum. (3d series) Was the same except that the serum was replaced by an equal quantity of physiological salt solution. A series of this kind was prepared for each of the five different yeasts employed. The tubes were then stood away for five hours in order that the solution might be complete, and the experiment resulted in the discovery that the serum from carcinoma patients possesses no solvent power (*substance sensibilitrice*). Brouha therefore concludes that inasmuch as the serum from carcinoma cases contains no *substance sensibilitrice*, it is very improbable that yeasts have anything to do with the origin of carcinoma; especially as Malvoz has shown that the action of the serums active upon yeasts are active upon all yeasts, and not upon any particular one injected into the animal furnishing the serum. This brings him to the same conclusion held by Borrel, that upon histological grounds the rôle of yeasts as agents in the production of carcinoma becomes less and less probable with increased investigation.

PROPHYLAXIS AND TREATMENT OF OLD AGE.

It has become a medical axiom that a man is as old as his arteries. Senescence, that condition characterized by the phenomena of old age, seems to be dependent upon a disturbance of nutrition that has for one of its characteristic manifestations a change in the walls of the small blood-vessels. This arterial sclerosis is brought about by numerous factors, the chief of which is an accumulation in the blood of excrementitious products. It is a common accompaniment of Bright's disease and many constitutional affections, and pathologists are still undecided as to whether the arterial sclerosis is primary and the parenchymatous conditions secondary, or if the reverse obtains. It is certain that if a man lives long enough he will have some degree of arterial sclerosis, the arterial degeneration occurring in the same degree as senile changes in other tissues.

Recently Muhlmann has advanced a new theory of senility. He refers to the changes in the nerve cells of the central nervous system. He has made numerous studies of the number of cells which are degenerated at the different periods of life, and finds that there is a progressive degeneration in old age, the number of cells which present marked fatty degeneration increasing as life advances. According to his theory arterial degeneration and all the phenomena of senescence depend upon the disturbance or perhaps withdrawal of the trophic influence of the nervous system, due to this progressive degeneration of its nerve cells. Such a view is simple, and is probably true in some cases. It would explain much regarding heredity, especially in relation to longevity, but it does not account for a large number of cases in which autointoxication and the infectious diseases produce changes in the blood-vessels and consequently senility.

Early in 1901, Trunecek began the treatment of arterial sclerosis with subcutaneous injections of an inorganic serum. In a general way the formula was intended to represent the salts contained in the blood. It is composed of

Sulphate of sodium	0.44 centigramme.
Chloride of sodium	4.92 centigrammes.
Phosphate of sodium	0.15 centigramme.
Carbonate of sodium	0.21 centigramme.
Sulphate of potassium	0.40 centigramme.
Distilled water	q. s. to make 100 grammes.

This solution is injected in doses varying from one to five centimeters, and is said to cause a profound modification of arterial pressure and afford immediate relief to the subjective symptoms which accompany arterial sclerosis.

It is with pleasure that we refer to these two recent contributions to the study of senility, as it is a branch of medicine that has been sadly neglected since the brilliant discoveries in the domain of the acute infectious diseases.

THE SURGICAL TREATMENT IN MITRAL STENOSIS.

Sir Lauder Brunton, in a preliminary note (*Lancet*, Feb. 8, 1902), proposes a very striking innovation in the field of surgery, it being no less than an attempt to relieve mitral stenosis by surgical means. The method has not yet been attempted on a human being, but he has carried out some experiments upon lower animals, which would lead one to think that the method is possible. The clinical history of mitral stenosis, and the mechanical impediment offered to the circulation, afford an inviting field for surgical speculation. These patients when in hospital and under treatment make a partial recovery, there is improvement in the circulation, the edema subsides, and they leave the hospital so far improved that it is possible for them to take up their usual occupation. In a few days or weeks they are back again with a recrudescence of all of the symptoms. This is repeated for months and years until an intercurrent pneumonia or involvement of the kidneys puts an end to the chronic ailment.

The experimental work of Brunton has been devoted to solving some questions connected with the technique of such an operation. As to whether the valve should be cut through at right angles, or whether the opening should be enlarged by an incision between the leaflets, is a matter upon which he is undecided, but thinks that the latter method would be preferable. In cats he has used knives made from hat-pins, to divide the valves. He has not decided as to the best form of knife; this depends upon whether the surgeon decides to operate from the auricle or the ventricle. The latter is less likely to bleed. The knife need not be much thicker than a needle. In exposing the heart in a human being, the incision should be made along the left edge of the sternum, outward along the lower borders of the third and fifth ribs, connecting their outer ends by a third incision, dividing the fourth and the fifth ribs. The flap thus made is turned back on the sternum, the external attachments of the ribs being sufficiently flexible to yield to the pressure. The lung is then pushed back and the pericardium freely divided. If the operation is made through the auricle, it would probably be necessary to incise one rib higher.

In his experiments he has been astonished at the ease with which the heart goes on beating in spite of its being handled. He ventures to suggest this operative procedure in view of the excellent results in surgical treatment of wounds of the heart.

SMALLPOX, COW-POX, AND SWINE-POX.

William G. Bissel, M.D., and Charles M. Zink, M.D., in the Monthly Report of the Department of Health, City of Buffalo, New York, January, 1902, vol. x, No. 1, make the following preliminary report relating to an investigation still in progress, of a peculiar dermal disturbance in swine and its possible relationship to smallpox.

The disease was first observed in December, 1901, among swine dressed in a large abattoir in Buffalo. The objects in view were: 1st, to establish or disprove the relationship between this disease and smallpox; 2d, to ascertain if swine were capable of being infected with the virus of smallpox or of vaccinia, and the nature of the peculiar dermal disturbance of the swine under examination. As regards results and final conclusions, although the work is far from completion at the present time, the following can be stated:

1. That the unusual disease noticed in swine is not of the same nature as smallpox.

2. That in the opinion of the investigators, it is impossible by any known means of inoculation to communicate smallpox to swine.

3. That there is an infectious agent present in vaccine that is distinct from that present in the virus of smallpox.

4. That the peculiar dermal disturbance, seen in the swine, is of unusual occurrence in this section of the country, and so far as it has been possible to ascertain it is not described in the literature of the day.

5. That inoculation of swine with the virus of smallpox does not confer immunity to vaccinia.

6. That most of the reports of the transmission of smallpox to the lower animals are without scientific substantiation.

7. That the investigators would suggest that with a more complete study into the nature of the variolæ of the different domesticated animals, a greater distinction, rather than a closer relationship, will be established, and that the relationship between these diseases and smallpox, with a possible few exceptions, will be found equally remote.

SUN PLAYROOMS ON CITY ROOFS.

A glance at the roofs in our cities leads to the inquiry why they are not utilized. They are great flat expanses covered with gravel, freely exposed to the light, and yet the poor city dweller passes his hours below them, much as the ground-hog burrows in the earth. Not only does a city roof have all the sunlight that is to be obtained, but there is a relative freedom from noise and dirt. Why the city dweller persistently neglects such an admirable location for a summer and winter home is past finding out.

W. P. Northrup, in the *Archives of Pediatrics* for January, 1902, has an excellent article on how playrooms may be constructed upon city roofs. He speaks of a room 20 x 20 constructed upon the roof of a house on Madison Avenue, New York. The room was supported by iron girders extending from wall to wall. The room was of iron roofed with glass, there was a wainscoting of yellow pine, and the floor was of the same material. From floor to peak the room was sixteen feet. The stairway leading from the upper story of the house was open, and in this way some heat made its way into the room; in addition a gas stove could be employed to take off the chill. The north wall of the room was solid, the other three sides being composed of windows that could be swung at an angle. The roof light could be cut off by curtains. The heating of the room was mostly by the sun.

A room constructed after such a pattern would be an ideal place for a sick person. It would admit of perfect isolation in case of infectious disease; in chronic pulmonary conditions it would lend itself to the open-air method. As a cool place in summer it would commend itself to those who cannot leave the city, and as a place in which a maximum of sunlight is to be found in winter and a place where the city-bred boy can play, nothing better could be devised. It affords an opportunity for the city denizen to come out from his cave into the sunlight and fresh air.

TUBBING IN TYPHOID FEVER.

A recent editorial in the *Therapeutic Gazette* of February 15, 1902, calls attention to the value of cold water in the treatment of typhoid fever, where the tub is not employed. So much stress has been laid upon the importance of tubbing in this condition that we are sure that many physicians have neglected hydrotherapy in the disease because of the impossibility of getting the patient to consent, and the folly of attempting to tub patients who have not the means

to obtain a trained nurse, or who are not in hospital. We are sure that these difficulties are so great that tubbing will never be a general practice in the treatment of typhoid. The editorial in question points out that it is not the tub itself that is of advantage, but it is the application of cold and the consequent stimulation of the nervous system, the cleansing of the skin, and the improved action of the eliminating organs that follows this treatment, that make it of value. All the service that can be obtained by the use of cold water may be reached by having the patient lie upon a rubber sheet and sponging him with water of a temperature suited to his needs. This method has some advantages over tubbing in the fact that it permits of application of cold to the back, which combined with the friction improves the circulation in these large muscles and prevents the stasis which occurs in dorsal decubitus.

THE NEW ANTISEPTIC, TACHIOL.

In the February 8, 1902, issue of the *Lancet* is an editorial referring to the new antiseptic, tachiol, which has been introduced by Professor Peterno, of Rome. It is a fluoride of silver. Its bactericidal properties are said to be remarkable, as in a dilution of 1 to 150,000 it killed the most persistent pyogenic organisms in one minute. In a strength of 1 to 200,000 it killed in one minute the typhoid bacillus. In a dilution of 1 to 1000 it killed anthrax spores which were capable of resisting a boiling temperature for fifteen minutes. The toxic power of tachiol is slight, considering its powerful germicidal properties. In guinea-pigs and rabbits no ill effects were observed until the quantity exceeded one centigramme per one hundred grammes of the animal's weight.

The therapeutic power of the new antiseptic is said to be marvelous. It almost instantly changes indolent ulcers into healthy granulating tissue, heals fistulas, and is especially valuable in overcoming tuberculous foci. In the last few years many antiseptics have been heralded as ideal, destroying the protoplasm of germs, but not affecting the same substance when forming part of the living body. We sincerely hope that the new antiseptic is all that is claimed for it.

ABSTRACTS.

MEDICINE.

Two Cases of Adiposis Dolorosa.—DERCUM, F. X. *Philadelphia Medical Journal*, vol. ix, No. 9, p. 396, March 1, 1902.

So far, twenty-five cases of this disease have been reported. Of these, but three have occurred in men, the case about to be described constituting the fourth.

Adiposis dolorosa. Front view, Case 1.

Adiposis dolorosa. Posterior view, Case 1.

The patient, 39 years of age, is of American birth, and a wood-carver by occupation. The family history is negative. He was of average health until 15, when he was acutely ill with some febrile affection. Following this he began to accumulate flesh, the fat forming large masses upon the side of the chest and the abdomen,

with smaller deposits upon the thighs and the upper parts of the legs. These fatty masses were exquisitely painful to touch. There were no spontaneous attacks of pain. As the fatty masses increased in size, there was progressive weakness and slight fatigue on exertion. The flesh would bruise easily, and a slight bruise would cause an ecchymosis. After a bruise of the left leg, an ulcer developed. Five years before coming under observation he had an epileptic seizure. The lower portions of the forearms and hands and the lower portions of the legs and feet are free from fatty deposit; the skin in this situation is so thin that the tendons can be readily discerned. There is some fatty deposit in the face, though this is much less in proportion than that which is observed in other parts of the body. There is a fold of fat under the chin. The face is somewhat flushed, with a tendency to lividity. The knee-jerks are normal. There is no ankle clonus, nor are there areas of anesthesia or hyperesthesia. The examination of the viscera, including the urine, showed a normal condition of the organs.

There was slight ptosis on the left side and some weakness of the internal rectus. The anterior portion of the conjunctiva was so translucent that the tendinous insertions of the various muscles could be distinctly seen. Behind the equator of the eyeball the conjunctiva was thickened and of a yellowish appearance. There were accumulations of fat in the orbital cavity which could be felt by the fingers. The reaction of the pupil was normal. The fundus changes were those of high myopia. The media were hazy, due to the vitreous opacity.

A second case was that of a woman 33 years of age. The family history was negative. Ten years before being seen she began to suffer from pain and soreness over various portions of the trunk and limbs. At this time it was noticed that the thighs were becoming very large. Later there was an increase in size of the arms and of the legs below the knees. Everywhere this enlargement was tender and sore to touch. These symptoms progressed rapidly until at the present time her thighs are enormously enlarged, so much so that a large mass of fat projects forward and hangs over the knees. There is an enlargement of the upper and middle third of the legs, decided enlargement of both upper arms and the upper and middle thirds of the forearms. There is some deposit of fat over the shoulders and over the trunk; generally, though, this deposit is not excessive and is evenly diffused.

The cardinal symptoms in these cases are fatty deposits, pain, asthenia, and psychic phenomena. While fatty deposit and pain

are the most prominent symptoms, the general nervous symptoms and the psychic alterations are so pronounced as to entitle them to be called cardinal symptoms. The asthenia is apparently not dependent upon the fatty deposits directly. Mental depression and slowness and sometimes hallucinations, usually marked irritability, and a tendency to ceaseless quarreling and vague ideas of persecution, sum up the psychic changes.

Latent and Masked Malarial Fevers.—CRAIG, C. F. *Medical Record*, vol. lxi, No. 7, p. 249, Feb. 15, 1902.

An analysis of 195 cases of latent and masked malarial fever as they have occurred at the Army Hospital in San Francisco is given. Most of the cases were returning soldiers from the Philippines. Some time ago an order was issued that all patients admitted should have a blood examination, and it is due to this fact that the large number of malarial infections was detected. The observations covered a period of fifteen months. Of the 195 cases, 44 were tertians, 1 quartan, and 150 estivo-autumnal. There is no means of estimating the number of parasites present in the blood, but 32 of them were classed as numerous and 163 as few. The period of latency cannot be determined, but it is believed that malarial parasites may be in a patient's blood for weeks or months before symptoms develop. In some cases this prolonged period of latency may be due to a small number of parasites, but there are some cases in which the parasites are numerous in which clinical symptoms are absent. The greater percentage of masked and latent cases of malaria occurred in patients suffering from diseases of the alimentary tract, especially dysentery and diarrhea. Next in frequency came those who were thought to have pulmonary tuberculosis.

By masked malaria is understood those cases in which the symptoms were predominantly in favor of some other clinical diagnosis. By latent malaria is understood those in which the clinical history presented no suggestion of a malarial element. A considerable number of cases could not be definitely placed in either class. Dividing them as near as could be, 90 were included under the masked infections and 105 under the latent. In chronic dysentery and diarrhea, which included 55 of these cases, the patients had numerous bowel movements with slight irregular rises of temperature, which were not in any sense suggestive of malaria. In some of these cases malaria might have been suggested, but taken in connection with the clinical history of dysentery they are to be classed as masked infections. In the cases of chronic diarrhea there was no

rise of temperature and no symptoms that could be interpreted as malarial. In no class of cases was a diagnosis of pulmonary tuberculosis made so often as in cases of malaria with daily elevations of temperature. There was cough, emaciation, and profuse perspiration. In all of these cases examination of the sputum for tubercle bacilli was negative, and the exhibition of quinine promptly relieved the patient.

From a study of this material it may be inferred how important the blood examination is in all cases of disease originating in places that are known to be malarious. The fact is not doubted that a malarial infection complicating any disease process endangers the patient's chance of recovery. The detection of the estivo-autumnal malaria is especially important, as it is this form of the disease that may at any time become pernicious and cause death within a few hours.

Median Nerve Palsy.—SNEVE, HALDOR. *St. Paul Medical Journal*, vol. iv, No. 3, p. 182, March, 1902.

Trophic changes in the skin and muscles are a result of peripheral nerve injuries; they have been exhaustively described, but there has been comparatively little reference to the bones. A case described by Sneve and illustrated with the skiagraph shows that after a median nerve injury, painless whitlows developed at the tips of the index-fingers, followed by the loss of the ends of the

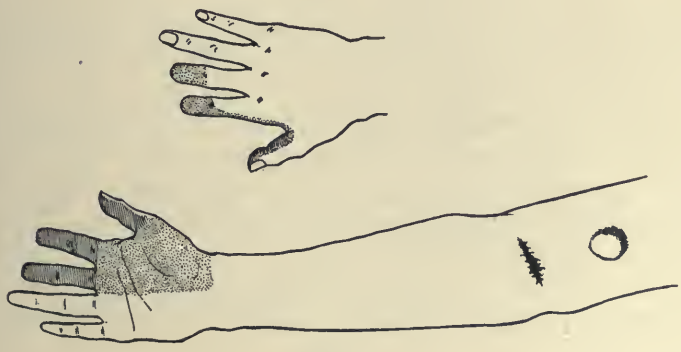

FIG. 1.

fingers and the nails. A neuroma developed on the retracted upper end of the divided nerve. Tactile sensation was abolished, as shown in Fig. 1. The temperature sense is abolished in the dark shading, and the loss of the sense of pain is coincident with that of touch. The palm of the hand was smaller by one centimeter in circumfer-

FIG. 2.

ence. The skin was apparently normal in function and appearance. The marked trophic disturbance of the bones, shown in the reproduction of the skiagraphs (Fig. 2), illustrates the importance of trophic influence to the osseous system.

Gaertner's Tonometer.—CRUMMER, LEROY. *Medical Herald*, vol. xxi, No. 2, p. 46, February, 1902.

In twenty-five healthy students, varying in age from 20 to 26, the readings obtained varied from 110 to 125. Gaertner places the normal at 110 to 130. The writer's lowest reading was in a case of collapse in which the pressure was 65. Another low reading was 70; the patient was a very anemic individual with spinal trouble. An improvement in the nutrition and his general condition raised the reading to 90, but with no change in the spinal symptoms. There is a parallelism in a low hemoglobin percentage and the reading of the tonometer.

	Hemoglobin.	Tonometer.
Meningomyelitis	45 per cent.	65
Sciatica	52 " "	80
Chlorosis	45 " "	90
Chlorosis	55 " "	90
Tuberculosis	62 " "	90
Tuberculosis	65 " "	90
Pelvic trouble	60 " "	95
Pelvic trouble	65 " "	100

The tonometer early indicates the inprovement in many cases. Where brown atrophy of the heart is to be looked for, the blood-pressure is below normal in all cases. Disease of the aorta commonly gives a high reading. Low pressures are found in compensated chronic endocarditis, following the infectious diseases.

In a case of aortic insufficiency the reading was 180. Under iodides this was lowered to 160, with a cessation of the anginal attacks. A man with aortic regurgitation, the day after an acute failure of compensation with pulmonary edema, had a pressure of 140. One month later, under good compensation, his tension was 180. These rapid changes in arterial pressure are easily detected with the tonometer, and it will doubtless prove a valuable guide in detecting beginning failure of compensation before there are other signs. Age increases the reading, and it is always raised in the chronic and acute diseases of the kidney.

In diabetes tension is increased, and seems to bear some relation to the amount of sugar excreted by the kidneys.

In nervous conditions in which the vasomotors are affected, tension may be high. The highest reading noted by the writer was in a case of pseudoangina which registered 240. Under nitroglycerin the pressure fell 40 points, and then the attack was over.

In arterial sclerosis the tension is increased; the highest reading noted was 200.

Human and Bovine Tuberculosis. — ADAMI, J. G. *Philadelphia Medical Journal*, vol. ix, No. 8, p. 356, Feb. 22, 1902.

A summary is given of the conflicting data bearing upon the communicability of human and bovine tuberculosis. Bovine tuberculosis is easily conveyed from animal to animal through the milk, by inhalation, or from contamination of drinking-water. Human tuberculosis may infect cattle, but it is believed that this is of rare occurrence, as it was with great difficulty that pure cultures of tubercle bacilli could be conveyed from man to animals. Swine may be easily infected with both human and bovine tubercle.

Human tuberculosis, in the majority of cases, is conveyed from one human being to another by inhalation. More rarely it gains entrance through the alimentary tract, and still more rarely through the surface of wounds or the genital tract. There is a strong probability that in the main the bacilli causing infection in man are derived from previous cases of the disease in man. By sojourn in the human body, the human tubercle bacillus has acquired proper-

ties differing from those which have been passed through cattle; they differ in shape, rate of growth, and the appearance of growths outside the body are different. Their virulence for different species of animals is altered.

These differences are not sufficient for us to say that we are dealing with distinct species. Bovine tuberculosis can be conveyed to man through wounds or through the digestive tract. By passage through cattle the tubercle bacillus is increased in virulence for cattle, rabbits, guinea-pigs, but has a lessened virulence for man. Save in very rare cases of wound infection there is no evidence that bovine tubercle bacilli infect adult human beings. Infants and young children may be infected with tubercle bacillus of the bovine origin through the agency of milk. The few positive cases of transmission of tuberculosis from cattle to man through the agency of milk indicate that infection is brought about only by the milk of cattle which are extensively diseased, more especially those in which the udder is involved.

A Method of Outlining the Stomach Without Instruments.—KNAPP, M. I. *New York Medical Journal*, vol. lxxv, No. 7, p. 282, Feb. 15, 1902.

The opinion commonly held that palpation gives but little information of the position of the stomach, excepting in emaciated patients, is not true. The methods ordinarily employed are not free from objection, as by them the axis of the viscus is often changed. The stomach weighted with water or inflated with air or gas does not occupy its normal position. Inspection of the outlines of the stomach can be made even where the abdominal walls are thick. The greater curvature of the stomach, and the lesser in cases of gastroptosis, can be seen.

The patient bares the abdomen and lies on a table on the back. The examiner now stands at the side or the shoulder of the patient so as to have to look either up to the stomach region or down to it. The eyes are now brought on the same level with the prominence of the patient's abdomen, and abdominal respiration is watched. Certain lines are seen to move up and down on the abdominal surface with respiration. The curvatures of the stomach are seen as fine lines moving under the skin. The position at which these lines stop is marked, and then the findings are confirmed by percussion. The approximated index and middle fingers of the left hand are placed on the abdomen, so that the line representing the curvature lies between the two fingers. Very gentle percussion is then employed, which, if there is a difference of resonance in the two

fingers, accurately shows the limit of the stomach wall. In the gentle percussion necessary in these cases a stethoscope is sometimes useful. Where there is doubt of the identity of the stomach, resort should be made to inflation of the colon.

Hysterical Tympanitis.—TALMA, S. *Berliner Klinische Wochenschrift*, 39th year, No. 5, p. 89, Feb. 3, 1902.

Hysterical tympanitis is produced usually by one of three causes: (1) Weakness of the upper muscles of the abdomen; (2) partial transverse contraction of the muscles of the abdomen; (3) contraction of the diaphragm. These are sufficient to produce a hysterical tympanitis which will last for a long time, and is frequently mistaken for a tumor of the abdomen. That a tympanitis simulating a tumor of the abdomen may persist in sleep the writer believes. This is a difficult fact to explain, and it may be possible that in these cases the patient simulates sleep at the time when the abdomen is observed.

SURGERY.

Transplanting the Omentum Between the Peritoneum and Abdominal Wall in Hepatic Cirrhosis.—ROE, W. J., and SPENCER, G. W. *Philadelphia Medical Journal*, vol. ix, No. 9, p. 400, March 1, 1902.

This operation was undertaken for the relief of hepatic cirrhosis and consequent ascites. The patient died eight months later, when an opportunity was given to examine the abdominal organs. The patient was 43 years of age and had been married since she was 17. After the birth of her third child, and four years after marriage, she suffered from what she thought was a slight attack of rheumatism, accompanied by an eruption upon the skin, some sore throat, and a loss of hair. Six months after the above symptoms she had a miscarriage, and subsequently had fifteen still-born children, including a pair of twins. She then gave birth to a child at seven months, which lived twenty days, and subsequently there were three still-births. Ascites began three months before she came under observation. The temperature was normal, the pulse was 120, and there was marked emaciation, the abdomen being enormously distended. There was edema of the feet and legs. The heart, lungs, and pelvic organs presented no signs of organic disease. The urine was normal. A diagnosis of fibrous hepatitis was made. The patient had never used alcohol. The cause of the hepatic disease was referred to syphilitic infection. The patient was put upon specific

treatment and mild purgation was used. Notwithstanding this treatment, the abdominal pressure increased so that it was necessary to withdraw the fluid. The fluid reaccumulated, and tapping was resorted to, each time the accumulation taking place more rapidly. The specific treatment was continued, but there was failing strength and increasing loss of flesh. At the end of twelve months, medical treatment having failed, an operation was decided on.

Upon opening the abdomen, which was done with a five-inch incision above the umbilicus, the parietal peritoneum was found to be thickened and it had lost its glistening appearance. On evacuating the abdominal fluid, the liver was found diminished in size, was firm to the touch, but not "hob-nailed." The gall-bladder was moderately distended, its ducts containing no calculi. The spleen was of normal size and consistence. The omentum was about four inches in length and was deficient in fat. Its arteries were numerous but small, and its veins were large and distended. A horizontal incision was made through the peritoneum extending three and one-half inches to each side of the abdominal wound. The peritoneum was then stripped from the abdominal wall down to and beyond the limit of the extremity of the limb of the median incision. This made a pocket between the peritoneum and the transversalis fascia three and one-half inches in depth and seven inches in width. Into this the omentum was carried and secured by a silkworm-gut suture passed through the abdominal wall and tied loosely upon the surface of the skin. Two such sutures secured each corner of the omentum in the corresponding pocket formed between the omentum and the abdominal wall. Practically the entire omentum was placed in the pocket. The advantages from placing the omentum in this way is that it secures extensive adhesions without the necessity of keeping up continuous drainage.

No attempt in this case was made to unite the capsule of the liver and parietal peritoneum by strapping the abdomen, as the liver was shrunken and the ribs carried outward by the repeated distention of the abdomen. Ten days after the operation was performed, paracentesis was done, and the sutures were removed from the abdominal wound, which had healed. At the end of four weeks the patient's health was better than it had been any time in the previous two years. Paracentesis was performed thirty-one times in the fourteen months before operation and twenty-one times afterward.

The autopsy showed thin bands of adhesion varying from three-fourths of an inch to five inches in length between the loops of the

intestine and the region of the transplanted omentum. Each of these contained a large vein. The omentum had formed adhesions on each side with the border of the colon, and also with the walls, sides, and margins of the peritoneal pocket.

The Results of Operation in Sixty Cases of Malignant Disease of the Breast.—SHEILD, A. M. *Lancet*, vol. clxii, No. 10 of vol. i, p. 643, March 8, 1902.

Attention is called especially to the importance of early diagnosis in mammary cancer. The significance of slight hardening or thickening in the glandular tissue of the breast in women past 40 years of age should not be overlooked. A nodule of cancer cannot be distinguished from a cyst, except by exploratory operation. Dubious tumors of the breast need exploratory operations as much as those of the abdomen. Importance is laid upon the necessity of removing the pectoral muscles and clearing the axilla in every case, as the glands are invariably involved. When everything appears normal, glands the size of a hazelnut or almond, and distinctly cancerous in structure, may be found beneath the pectoralis minor muscle.

In the sixty cases, with the exception of two where the diagnosis was uncertain, the operation was very thorough. The axilla was in every case dissected out and the lymphatic tissue removed. In cases where the axillary glands were involved, the lower part of the pectoral muscle was removed, and in several cases the pectoralis minor muscle was cut across to give access to the chain of glands lying below the clavicle. Of forty cases, eight were found to be well for a period of five years and upward; four for four years and upward; seven for three years and upward; and eleven for two years and upward.

The condition of the arm as to usefulness is an important factor in the operation. If it is tied to the side by a painful scar and there is chronic edema of the hand, the operation has been of little service. These results are brought about by a free removal of the skin of the axilla. If this is necessary, owing to the disease of the skin, the operation is hardly worth doing. Soon after operation, passive movements of the shoulder should begin, to prevent contraction of scar tissue.

The conclusions drawn from the carefully tabulated results in these sixty cases are that the risk of removing cancer of the breast by extensive operation is small; the mortality should not be above one or two per cent. Early and free removal gives a prospect of years of freedom from the disease, and in a fair percentage of cases

good health. The cases which do badly are (1) soft, rapidly-growing cancer, in young and vascular women; (2) cases of long continuance before operation, where the skin and cervical glands are widely infected. Early exploration by incision of small nodules and infiltrations of the breast is of the first importance. This latter should be promptly undertaken by the general practitioner, who sees these cases early.

Splenectomy in Splenic Anemia or Primary Splenomegaly.—HARIS, M. L., and HERZOG, M. *Chicago Medical Recorder*, vol. xxii, No. 3, p. 207, March, 1902.

Two splenectomies are reported which are accompanied by good clinical histories in which the histological changes in the spleen are described at length. In both cases there was an endothelial proliferation and hyperplasia. The process resembled somewhat that found in lymphangioma. The changes in the spleen are regarded as in some way responsible for the blood deterioration noted in splenomegaly. It is the only explanation why the removal of the altered spleen is followed by recovery. Including the two cases reported by the writers, seventeen splenectomies for primitive splenomegaly have been reported. Of the total number (nineteen) fourteen recovered, four died, and in one case the result is not stated. Of the after-history of the cases that recovered but little is said. In eight cases it is stated that the patients recovered and were well, but the length of time after operation is not noted. In one case it is given as one year, in another twenty months, and in another thirty-three months. The first case operated upon by the authors has now been under observation for twenty-two months. It is contended that if patients recovered after splenectomy, regaining their health, it would be established as a proper method of procedure in the treatment of cases in which the spleen is enlarged, and which do not yield to medicinal treatment. The earlier operation is performed the better, as the surgical difficulties increase with the increase in size of the organ.

The median incision is the most desirable in the majority of cases. The usual method of dividing the gastrosplenic omentum between the ligatures, and freeing the upper end of the organ to turn it out of the abdomen before ligating the pedicle, has certain difficulties when the organ is considerably enlarged. In such cases it is better to extend the incision downward and draw the lower end of the spleen upward. In this position the splenic vessels are easily ligated. It is better to ligate the vessels at once, as the thin veins

are apt to tear if a clamp is used. After the pedicle is ligated and divided, the spleen is readily drawn outward and the gastrosplenic omentum dealt with.

The Significance, Pathologic and Clinical, of Abdominal Pain.—RICHARDSON, M. H. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 9, p. 218, Feb. 27, 1902. (Concluded from No. 8, p. 192.)

A lengthy article is summarized by the statement that under no circumstances should the pain be masked by opiates until after a thorough physical examination. In all cases of abdominal pain, the accompanying physical signs should be carefully considered. When hemorrhage is suspected the abdomen should always be explored. If the patient is in collapse and too weak to undergo exploration, preliminary infusion of salt solution should be made into the veins and under the skin. When the pain is excruciating and the abdomen shows signs of infection, exploration should be made at the earliest possible moment. The site of the initial pain, as described by the patient and friends, should indicate the place for the incision where the other symptoms leave the operator in doubt. The history and signs other than pain must be relied upon for an exact or reasonably positive diagnosis. When some of the unusual abdominal lesions are suspected, exploration should be made. In some cases it may be useless, but if resorted to as a routine procedure in all cases it would save the greatest number of lives. When there is the least doubt, the genuineness of the pain should be tested as thoroughly as possible. The pain of an atypical typhoid, of a pleurisy, of a pneumonia, must be guarded against. When typhoid is prevalent in a community the greatest precaution must be taken lest the surgeon be misled by the pain. One should be on his guard lest he confuse the pain of simple functional disturbances with that of organic disease. When uncertain as to the significance of pain, the doubt should be given the patient and a surgical exploration made. Finally, when no exploration is indicated pain should be controlled by morphine, hypnotics, or, if necessary, by general anesthesia. With few exceptions, chiefly cases of renal and biliary calculi, the pain that demands general anesthesia indicates operation.

A New Combined Electrocautery Incisor for the Bottini Operation.—YOUNG, H. H. *Bulletin of the Johns Hopkins Hospital*, vol. xiii, Nos. 131–132, February and March, 1902, p. 36.

Freudenberg's 752 cases, with good results in 85.5 per cent, a failure in 7.5, and a mortality of from 4 to 6 per cent, show the importance of the Bottini method in dealing with prostatic enlarge-

ment. Prostatectomy is an operation of value if thoroughly performed, a condition which has only obtained of late, most of the earlier operations consisting of simply snipping off the intravesical projections, leaving the parts which compress the deep urethra. There is no question that the complete removal of the gland, which may be easily accomplished by enucleation by the finger, is a successful operation when accurately carried out. Prostatectomy is not suitable in small sclerotic glands and cannot be carried out in patients who are too old or feeble to withstand the shock of the operation. It is in this class of cases that the Bottini operation has achieved its best results. As the Bottini operation is not devoid of mortality, and a certain number of failures occur after it is employed, it is still an unsettled question whether it should substitute prostatectomy in young subjects who are able to have the more radical operation.

A number of deaths have occurred from the Bottini operation from avoidable causes, particularly ill-placed or too lengthy incisions. Sometimes the cautery blade has burnt its way into the rectum, due to the beak of the instrument being caught in a post-urethral pouch. In some cases where a useless anterior cut is made, the space of Retzius has been opened. The incision should never be more than 3.5 or 4 centimeters in length.

The instrument of Freudenberg is preferable to that of Bottini, but it is evident that it is not adapted to all cases, as the obstructions are of different sizes and shapes, and it would be unreasonable to think that an instrument with a single blade would meet all the indications.

The instrument devised by the writer has four interchangeable beaks. The latter is so shaped that it cannot possibly slip by the prostatic orifice in the urethra, which accident readily occurs with the Freudenberg instrument.

A Method of Breaking Down Joint Adhesions.—ORD, G. W. *Lancet*, vol. clxii, No. 2 of vol. i, p. 87, Jan. 11, 1902.

The breaking down of recent adhesions without an anesthetic is a difficult matter, causing considerable pain to the patient, and is apt to lead to a long tussle between the practitioner and patient. Much of the difficulty is obviated by having the patient in a proper position and fixing the part above the stiff joint, and then breaking the adhesions up by quickly flexing the member. To attempt to break down recent adhesions in the shoulder- or the wrist-joint with the patient sitting or standing is unwise, as the patient is in the best

possible position to resist. The method as applied to the various joints is as follows:

The Shoulder-joint.—For these manipulations the surgeon stands behind the patient's head. The patient lies flat on his back on a mattress, and the surgeon's left hand in operating on the right shoulder being placed flat on the clavicle of the affected shoulder, he pins the patient to the mattress or the table, preferably to the latter; the operator's free hand then grasping the elbow raises the arm quickly to a level with the shoulder-joint.

The Wrist-joint.—The patient's forearm is placed on a table in the supine position. The surgeon's left hand pins down the forearm to the table, whilst his right, grasping the patient's hand, quickly flexes it to a right angle.

The Finger-joint.—This joint is treated in a similar way, the hand being placed on the table with its palmar surface upwards.

The Knee-joint.—The patient lies prone on the bed. The surgeon's left hand pins down the thigh, whilst his right, grasping the leg above the ankle, quickly flexes the knee.

It is claimed for the method that by it the adhesions are broken down and the pain caused is only momentary; that a large amount of joint movement is obtained at once by means of far less force than usual; that the resistance of the patient is reduced to a minimum, and that the period of passive movements is greatly shortened, owing to the large amount of mobility secured in the initial effort.

A Successful Removal of a Subcortical Glioma of the Lower Part of the Left Ascending Frontal Convolution. — STEWART, JAMES. *Montreal Medical Journal*, vol. xxxi, No. 1, January, 1902.

A man aged 37 years, without previous warning, suddenly became speechless for about twenty minutes. There was recurrence of attacks of a similar character every few days for a period of several weeks. These symptoms were followed by headache and optic neuritis. Then facial spasm, followed by paresis of the lower facial muscles, developed on the right side, as well as a weakness of the left half of the tongue. The loss of speech was later replaced by a dysarthria, first of the labials and later of all letters and words, finally passing to a practical anarthria.

At the operation a tumor was found immediately beneath the lower part of the ascending frontal convolution. The removal was easily accomplished, and was followed by an immediate improvement in the speech and a disappearance of the facial paralysis. Two months after the operation there was no evidence of the previous trouble excepting slowness of speech.

Special points of interest in relation to this operation were the correct location of a subcortical growth, and that dysarthria and not aphasia characterized the form of speech disturbance in the growth in this situation, it being so situated as to compress the speech tract some distance from the motor speech center, but near enough to involve the commissural fibers that pass over to the right hemisphere in the corpus callosum. The case confirms the view of Bastian that dysarthria is the usual form of speech disturbance in subcortical lesions. There is no way of distinguishing between subcortical lesions and nuclear degeneration in the bulb, excepting from the associated symptoms.

The X-ray in Locating Foreign Bodies in the Eye.—SWEET, W. M. *Philadelphia Medical Journal*, vol. ix, No. 5, p. 208, Feb. 1, 1902.

The Roentgen rays offer the most certain means of detecting and locating foreign bodies in the eye. The foreign body should always be located by this means before using the magnet. Frequent insertion of a small magnet into the vitreous injures the eye and renders later attempts at extraction difficult. The employment of a large magnet is dangerous when the position of the foreign body is not known. Early extraction offers the best chances of saving the eye. When the track of the body is through the cornea and lens, its position in the vitreous indicates whether less damage will be done by removing the metal through the entrance wound, or through a counter-opening in the sclera. In cases of fragments of steel in the vitreous, the use of a large magnet drawing them to an opening in the sclera will, it is believed, give better results than other methods. Iron or steel which has remained in the eyeball until a fibrocellular covering has formed cannot be dislodged with the magnet. Extraction with forceps and the employment of normal saline solution to replace the loss of the vitreous sometimes saves the eyeball. Forceps extraction must be employed when the foreign body is of copper or glass. Extraction is a safe operation, and with proper precautions is not followed by panophthalmitis or meningitis.

Traumatic Rupture of the Gall-bladder Without Injury of the Liver.—WILLARD, DE F. *New York Medical Journal*, vol. lxxv, No. 9, p. 369, March 1, 1902.

A boy five years old was injured by the wheels of a heavy express wagon passing across the abdomen. The skin was unbroken, except in the left groin. There were no fractures of the pelvis or other bones. There was shock, but no collapse. No blood was

passed in the urine or by the rectum. For a period of two weeks following the accident the temperature was elevated, reaching as high as 103°. The stools were clay-colored, and he was obstinately constipated, but not jaundiced. There was marked tympanitis, with tenderness in the right lower abdominal quadrant, but no tumor could be felt. He remained in bed for two months, at the end of which time the spine was found to be rigid and tender. Three months after the injury there was extreme exhaustion, intense pain in the abdomen and back, and marked bulging and tenderness of the entire abdomen. The spine in the lumbar and dorsal regions was rigid, with a decided kyphosis. The abdomen was distended by an elastic, fluctuating mass as high as the umbilicus. Notwithstanding that there was no marked leucocytosis, the fluid in the abdomen was thought to be pus, probably having its origin in a spondylitis, or from a traumatic, purulent appendicitis.

On opening the abdomen, sixty-four ounces of bile was evacuated, and the abdominal tumor subsided. The patient was in such a condition that the gall-bladder could not be repaired, and fluid reaccumulated. Later, and without operative intervention, the drainage of bile into the abdominal cavity ceased, and the bile was passed into the intestine. The patient made a good recovery.

The Operative Treatment of Chronic Bright's Disease. — PRIMROSE, A. *Canadian Journal of Medicine and Surgery*, vol. xi, No. 3, p. 143, March, 1902.

A child ten years of age was admitted to hospital, suffering from nephritis. The history of the case was obscure, but for six months before admission there was general anasarca and ascites. During that time the abdomen was tapped seven times. On admission the urine contained 1.6 per cent of albumin, the abdomen was distended, and there was general edema. The abdomen was tapped and 180 ounces of fluid evacuated. The urine contained numerous hyalin, granular, and epithelial casts. An incision down to the right kidney showed that it was enlarged. A cut was made in the capsule two inches long. For two weeks the wound in the lumbar region was drained. Following the operation the urine increased from 14 ounces in 24 hours to 40 ounces, while the percentage of albumin fell to 0.8. The favorable effects following the operation led to an exposure of the left kidney, and its capsule was removed. The child was critically ill for some days following the operation, and later developed a pneumonia. Notwithstanding these unfavorable complications the amount of urine rose to 44 ounces in 24 hours, the

albumin diminished to 0.3 per cent, and the casts were diminished in number. The general edema vanished, and the ascitic fluid was reabsorbed.

Sixty-two days after the last operation the child was stronger, the anemia had largely disappeared, and the albumin had fallen to a mere trace. A few casts were found in the urine, and there was no ascites.

THERAPEUTICS.

The Rate of Growth of the Epithelium of Ulcers. — DEUTSCH, S. *Medical News*, vol. lxxx, No. 11, p. 504, March 15, 1902.

The writer has studied the healing of ulcers in one hundred cases observed at the Vanderbilt Clinic. The measurements were made every week. He has found it convenient to divide the ulcers into three classes: those belonging to the varicose or eczematous variety, those due to constitutional syphilis, and those due to trauma, the latter including burns and infected wounds. The situation of an ulcer is most important from the standpoint of dealing with it. Those upon the malleoli, heel, or arch of the foot are difficult to treat; an ulcer on the arm will heal more quickly than one on the leg. An ulcer that is clean at the outset of treatment will heal quicker than one that is gangrenous. The depth of an ulcer is the greatest obstacle to healing. If an ulcer is superficial and the structures lying beneath the epithelium are intact and abundantly supplied with blood-vessels, the epithelium will quickly grow over the ulcer. In old people ulcers are relatively difficult to heal. Hot weather is an impediment to the growth of epithelium, as it increases the irritation and secretion.

Of the total number of cases, sixty-seven belong to the varicose or eczematous ulcers. The most frequently used stimulating application was balsam of Peru. Sometimes this increased the inflammation, but in the majority of cases it proved a valuable application.

Red wash is a milder stimulant than balsam of Peru, and it is less irritating. It is especially useful in traumatic ulcers and raw wounds where there is objection to the use of iodoform. Creolin is the most efficient application for gangrenous or sloughing ulcers. As long as an ulcer has a gangrenous area with an offensive odor, any stimulating application is out of place. The drug should be used in one-half per cent strength, increased in the more severe cases to one per cent.

Silver nitrate stick was employed as a stimulating application,

but was of little service. Ichthyol ointment is, like the balsam of Peru, both stimulating and irritating. It may benefit some ulcers, but it produces an intense itching and does not have any advantage over other stimulants. Lycopodium is to be used when the discharges from the ulcer are foul and where the stimulating application tends to dermatitis. Lycopodium will not heal the ulcer, but it absorbs the secretions.

The writer concludes from his carefully observed material that the rate of growth of epithelium is in direct proportion to the size of the ulcer. In the majority of cases it is from two to three and a half millimeters per week. The time required in healing an ulcer is not related to its duration; an ulcer of four months' standing does not heal quicker than one of four years', other conditions being equal. The rate of growth of epithelium in traumatic ulcers is irregular and is not related to the size or duration of the ulcer.

Hypnotic Action of Apomorphine in Alcoholism.—COLEMAN, W., and POLK, J. M. *American Medicine*, vol. iii, No. 10, p. 381, March 8, 1902.

Attention was recently called to the value of apomorphine as a hypnotic in cases of alcoholism. The writers have taken the opportunity to test extensively the use of this remedy, having used it in 300 cases admitted to the Bellevue Hospital. Eighty-seven cases are analyzed for the purposes of this report. A number of case histories are given.

To act as a sedative, apomorphine should be administered hypodermically. In thirteen cases it was given by the mouth, and only two of these patients slept. Of seventy-four cases, it acted as a hypnotic in fifty. Nearly one-half of the patients vomited. The dose cannot be definitely stated. It is best to begin with one-thirtieth of a grain or less and repeat this in a short time. If vomiting occurs, the drug should not be repeated until several hours have passed. The drug should be avoided in patients who are weak. The hypnotic action lasts only a few hours, and when the patient awakens his condition is practically unchanged, except in "ordinary drunks." The best results are obtained from apomorphine when it is followed in a few hours by a recognized hypnotic, such as chloral, bromide, etc.

A Native Remedy for Blackwater Fever.—O'SULLIVAN-BEARE, D. R. *Lancet*, vol. clxii, No. 5 of vol. i, p. 282, Feb. 1, 1902.

Hemoglobinuric fever is one of the most deadly maladies of the tropics. Comment was excited in the medical journals by the statement of Koch that this condition was caused by the administration

of quinine to the malarial patients. The writer describes several cases which presented a typical blackwater fever to which no quinine had been administered. It is thought that the hemoglobinuria is caused by a breaking down of the red corpuscles, this taking place so rapidly that they cannot be eliminated by the liver, and consequently the hemoglobin is set free in the blood and appears in the urine.

The native remedy for this disease is derived from a tree—*Cassia Beareana*. Excellent results have been obtained from the administration of this remedy in cases in which quinine appeared to do more harm than good. In cases in which quinine has been administered for a long period and has failed to act, relief has been obtained by the administration of the cassia. The remedy has been tried by the members of the Roman Catholic Mission in East Africa, a decoction of fluid extract being used with excellent results.

The native method of preparing the drug is to chop a portion of the root into small pieces and boil about one dozen one-inch sections in a gallon of water for one-half hour. There results a red-colored fluid, which is given freely to the patient. It is non-toxic.

Adrenalin as an Addition to Solutions for Local Anesthesia.—ELSBERG, C. A. *American Medicine*, vol. iii, No. 9, p. 365, March 1, 1902.

The removal of a sebaceous cyst, the opening of an abscess, or similar minor operation, is facilitated by the suppression of hemorrhage. The application of sponges to a bleeding surface causes more or less pain unless the anesthesia is perfect. If adrenalin is added to solutions for local anesthesia there is an immediate blanching of the skin and the operation is quite bloodless. If one drop of 1-to-1000 adrenalin chloride is injected under the skin, a slight burning sensation is felt, but there is no anesthesia. Within one minute an area of skin about two inches in diameter becomes blanched and remains so for from six to twelve hours. With weaker solutions proportionately less effect and of shorter duration is produced. When local anesthetics such as cocaine or eucaine are associated with the adrenalin, there is the same blanching of tissues, but there is no interference with the local anesthetic action of these drugs. It has been the practice of the writer to add adrenalin chloride in a proportion of 1 to 5000 or 1 to 20,000 to solutions of cocaine for local anesthesia. Under such a solution only the larger blood-vessels bleed when they are cut, and there is very little oozing. In none of the cases was secondary hemorrhage noted.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

The Treatment of Eclampsia by the Method of Professor Stroganoff.—NEWELL, F. S. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 8, p. 192, February, 1902.

Last year Stroganoff published a series of fifty-eight cases of eclampsia which came under his observation in the years from 1898 to 1900. A definite routine treatment was adopted, and none of the patients died. In view of the fact that the average mortality from eclampsia is from 20 to 30 per cent, it is evident that the cases reported were of an unusually benign type, or that the method of treatment was more efficient than any previously described.

Stroganoff believes that eclampsia is an acute infectious disease which runs an almost definitely self-limited course, seldom exceeding twenty-four and rarely forty-eight hours. The principal danger is in the convulsions, which profoundly depress the heart and respiratory centers. It follows from this that the convulsions are the dangerous element, and so far as possible they must be suppressed. Accordingly the indications in the treatment of the disease are: (1) The prevention of the convulsion by lessening the irritability of the nervous system and by removing all external sources of irritation, especially those connected with the birth canal. (2) The strengthening of the vital processes by careful supervision of the cardiac and pulmonary circulations by securing as large a quantity of oxygen as possible, and by prompt delivery.

These indications are met by the administration of oxygen during the convulsions, combined with morphine and chloral. Cardiac stimulants are given when the heart's action is weak, and prompt delivery is resorted to when the convulsions do not yield to treatment. A milk diet is employed, and all methods which tend to distress the patient are avoided. Chloroform does not stop the convulsions and is injurious to the patient. If the patient is under observation at the time of the first convulsion, one-quarter grain of morphine sulphate is given hypodermically at once. This is to be repeated in cases of average severity once an hour. If the patient is restless the dose should be repeated earlier, while in mild cases the dose should be lengthened to two hours. About two hours after the last dose of morphine, or earlier if the patient is restless, 20 to 40 grains of chloral hydrate is given by the mouth or rectum. The chloral is to be given at intervals of from six to ten hours without reference to whether the convulsions have ceased or not. If the

patient is restless or unconscious, the effect of the chloral should be kept up for a second twenty-four hours. If at any time during this interval convulsions recur or are shortened, the morphine should be repeated as at first and the chloral continued. The morphine should never exceed one-quarter of a grain at a single dose. If the convulsions do not cease early in the treatment, immediate delivery is indicated. Sweating, which is so commonly employed in eclampsia, should not be used. Both hot-air and hot-water baths are often harmful, depressing the overburdened heart and favoring recurrence of the convulsions. These drawbacks more than counterbalance the slight benefit obtained by the increased excretion of toxins.

The method of Stroganoff has been employed in nine cases in the Boston City Hospital, but in only five was it strictly followed to the exclusion of other forms of treatment. The results in the main were satisfactory. Postpartum cases yield very readily to the sedative treatment. In eight out of the nine cases the convulsions ceased as soon as the second dose of morphine was administered. Among the nine cases, four were postpartum and five were antepartum. In all the postpartum cases convulsions ceased promptly and the patients recovered. In the antepartum cases the convulsions ceased promptly in four; in the fifth the morphine had no effect on the convulsions, which increased after the delivery, in spite of all the measures taken to prevent them, the patient dying about twenty-four hours after the first attack.

The cases treated in the Boston City Hospital are too few to pronounce a definite opinion as to the value of the treatment, but it may be stated that in postpartum eclampsia morphine and chloral in combination have a beneficial action in controlling convulsions. In antepartum eclampsia the treatment is less efficient, but the course of the disease is altered for the better in the majority of cases. The results obtained warrant a further trial of the method.

A Simple Method for the Bacteriological Examination of Milk.—JOHNSTON, WYATT, and JONES. *Montreal Medical Journal*, vol. xxxi, No. 2, February, 1902.

The value of bacteriological examination of milk is only beginning to be realized by health boards and the medical profession. The usual method of making cultures by dilution is cumbersome, and practically the same results can be obtained by using a loop. The writers have found that wire of No. 25 gauge, when formed into a loop which fits closely over a No. 18 knitting needle, furnishes a loop which takes up with great constancy $\frac{1}{1000}$ cubic centimeter of milk.

The gelatin contained in a bottle is warmed until it is quite fluid, and then is inoculated by a loop full of milk. The vessel containing the gelatin is then thoroughly shaken, and the gelatin is allowed to harden by cooling.

An outfit containing a bottle with some gelatin and a sterilized loop contained in a glass tube may be sent in a mailing case and immediately returned to the health board. The inoculation can be made by any intelligent layman. A sample of milk should always be sent with it, in order that preservatives may be tested for, as these always give a low percentage of bacteria.

In reference to bacteriological purity, the writers divide milk into four classes: Class 1, in which there are less than 10,000 per cubic centimeter. Class 2, 10,000 to 100,000; this is not a first-class milk, but may be considered as usable. Class 3, 100,000 to 1,000,000; this gives a milk of poor quality, which should be Pasteurized before using. Class 4 has over 1,000,000, and has so far deteriorated that it is unfit for food. Milk containing chemical preservatives is unfit for use. Good Pasteurized milk should not contain more than 100 to 200 bacteria to the cubic centimeter. To keep the number of bacteria below 10,000 at the time of delivery, great care must be exercised in milking, straining, cooling, and shipping the milk. Failure to obtain this result is to be attributed to neglect of some essential precaution. In temperatures below 50° F. there is little increase in the number of bacteria in milk.

FORENSIC MEDICINE.

Electric Shocks.—ASPINWALL, F. B. *Lancet*, vol. clxii, No. 10 of vol. i, p. 660, March 8, 1902.

In a paper read before the Institution of Electrical Engineers, the writer discusses severe electric shocks which have not proved fatal. He has collected, both from his own experience and that of friends, particulars of as many cases as possible. The attempt is made to answer certain questions. The first, is there individual susceptibility to an electric shock? The writer undertakes to prove that not only are people differently affected, but the same persons under different circumstances do not feel the same. Moistness, callosity, the condition of the skin, nervous temperament, the path which the current takes through the body, health or disease, drunkenness or sobriety, sleep, area, nature of the contact, familiarity

with shock, and other causes, play an important part in determining the effects of the current.

As to the question of disease altering the susceptibility to an electric shock, the writer refers to some observations made by certain electricians upon themselves relative to their own resistance. One man in the group had a persistently low resistance, and was abnormally sensitive to electric shock. He was later found to be suffering from kidney disease.

Moisture of the skin may serve to lessen the effects of shock. A man who was perspiring freely sat down on a transformer which was grounded. In leaning back he touched a terminal with his head, and thus received a 2000-volt shock. He was wearing a thick flannel shirt which was wet with perspiration. The shock was severe, a hole being burned in his trousers, and the back of his head and the skin of his buttocks were severely burned. If the current had not been shunted by the wet shirt and skin, the man would, in all probability, have been killed. As it was, he was not rendered unconscious. There is some evidence to show that during sleep very considerable currents may be passed through the body without waking the individual. The observations relating to shock during sleep are too few, however, to be of much value in determining the modifying effects of sleep.

One of the most important factors in determining the fatality in the passage of an electric current is the direction it takes through the body. Thus from foot to foot, or from hand to hand, is not usually so severe as from hand to foot, particularly from the right hand to the left foot, or the reverse.

The most important question relates to contact. In electrical conduction not only must contact be good, but the area must be sufficient to carry the current. When a man receives a shock this is equally true. It is commonly safe to work with high voltages, as contact is usually imperfect. A low voltage might be sufficient to cause death if there was sufficient area of contact. Burning of the surface is a provision that protects against fatal shocks. It not only numbs the nerves, but throws additional resistance in the pathway of the current.

It is usual for a person to give a cry at the time the current passes. This is caused by a rapid drawing in of the breath followed by a half-sigh, or shriek. The cry is usual, but not invariably present. Occasionally a person may be able to speak after a fatal shock has been received. As to the comparative effect of direct and alternating currents, the writer is of the opinion that the after-effects of

the direct current shock are worse than those of an alternating current. Under the conditions in which shock usually occurs, if contact is made with metal in such shape that it cannot be gripped, the direct current seems to knock the person down, while an alternating current draws him closer and seems to tie the body into a knot. On the other hand, if the metal is grasped, the direct current shock seems to hold tighter than the alternating current.

The Possibility of Demonstrating the Presence of Tetanus Toxin in the Blood of Buried and Putrefied Cadavers. — SYMANSKI. *Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, vol. xxx, No. 25, Dec. 31, 1901, p. 976.

The writer, while working at the institute at the University of Königsberg in Prussia, received from the authorities a quantity of blood and some fragments of tissue from a patient who had died of traumatic tetanus some five weeks before and whose body had been exhumed for medicolegal confirmation of the diagnosis. Knowing the unstable nature of tetanus toxin, it was deemed impossible to discover its presence in the blood and tissues, but an attempt was made to do so by filtering the blood through a porcelain filter and injecting the clear, red fluid thus obtained into white mice. These little animals received quantities varying from one-fourth to one cubic centimeter of the fluid. Some died immediately after the injection, supposedly from the presence of putrid substances, to which they were more susceptible than others which lived for four days and then manifested symptoms of tetanus, from which most of them died, but from which one recovered.

From these observations, Symanski concludes that it is possible to demonstrate the presence of tetanus toxin in the blood after the lapse of a number of weeks and after the dead body has putrefied.

[If this observation be correct, forensic medicine has received an important advance, but it seems to us that the actual demonstration that the tetanizing substance produced the death of the guinea-pigs remains incomplete, as it is by no means certain that there were not other substances present capable of producing chronic spasms and death. The final proof of the nature of the poison contained in the putrefied blood should be its inactivity in the presence of antitetanic serum, and to have made his demonstration complete Symanski should have injected some of his mice with a certainly fatal quantity of the poisonous serum together with enough antitetanic serum to protect them. Had they then recovered no other interpretation could be placed upon the experiment than that the

poison separated from the blood by the porcelain filter was tetanus toxin, and to those who may repeat this experiment for the purpose of medicolegal demonstration we recommend the employment of this final test.—Ed.]

Sunburn Resulting Fatally.—Burdick, F. E. *Providence Medical Journal*, vol. iii, No. 2, p. 68, March, 1902.

A boy 12 years of age, of delicate constitution, was exposed to the direct rays of the sun while bathing. No discomfort was observed until after his return home, when there were the usual sensations of heat and tenderness of the back and extremities. Four days later there was considerable pain in the region of the sunburn, and upon examination the back from the shoulder-blades to the sacrum was found to be diffusely reddened and spotted with vesicles, some of which were becoming pustular. Several small localized areas were edematous and dark in color. The remainder of the surface of the body showed a mild erythema with an occasional patch of exfoliating epidermis. The temperature and pulse were slightly elevated, but there were no other systemic disturbances. The degenerative changes in the affected area progressed until several small sloughs formed. On the ninth day there was pain in the epigastrium and tenderness on pressure; the temperature and pulse rapidly rose. There was vomiting, and the abdomen was tympanitic. Albumin and renal epithelium appeared in the urine. On the tenth day the patient's pulse reached 160, the temperature 105°. Twelve days after the exposure the boy died.

Death was thought to be due to lesions of the intestinal tract, as a secondary result of the sunburn.

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

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ORIGINAL ARTICLES.

TETANUS AND VACCINATION—AN ANALYTICAL STUDY OF NINETY-FIVE CASES OF THIS RARE COMPLICATION.[1]

BY JOSEPH McFARLAND, M.D.,
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During the year 1901 the occurrence of smallpox in different parts of the United States stimulated the health authorities to a vigorous endeavor to protect the public by vaccination. Accordingly, during the year 1901, throughout many parts of the United States, an unusual activity in vaccination took place.

The occurrence of a number of cases of tetanus succeeding vaccination, first in Cleveland, Ohio, and then in Camden, New Jersey, early attracted my attention, as this, to me, unknown complication seemed a matter of the greatest importance, increasing the danger of vaccination and correspondingly arousing the animosity of those who have banded themselves together for organized opposition against this well recognized and only safeguard against smallpox.

The cases of tetanus in Camden have been so exploited in the newspapers, and have been made the subject of so many editorials and comments in the medical press, that they will, no doubt, form the starting-point of numerous future attacks against vaccination. I therefore deem it important that as many cases of the complication as possible be brought together and carefully analyzed, in order to determine whether tetanus be a necessary or an avoidable complication of vaccination. If a necessary complication we should be prepared for it and know how often to expect it; if an avoidable one we should seek to eliminate it by every precaution regarding

[1] Read at the second annual meeting of the American Association of Pathologists and Bacteriologists, March 28, 1902.

the selection of a superior virus and the performance of a careful operation.

Tetanus is not a recognized complication of vaccination. The only text-book I have been able to find making any mention of it is the recent edition of Osler's "Text-book of Medicine," in which it is simply stated that "tetanus occasionally follows vaccination." In the "Minority Report" of the British Commission, published in 1896, in which the disadvantages of vaccination are carefully and forcibly summarized, a single case is mentioned, apparently the only one they were able to collect. Ordinary writers upon vaccination entirely ignore tetanus. The literature on the subject is extremely meager. In the Index Catalogue of the Surgeon-General's Library at Washington, but *seven* cases are mentioned under titles by which they can be recognized, and I was able to find but fifteen cases in the literature.

TETANUS CASES FOUND IN THE LITERATURE.

Dr. J. D. Cottman: *New Orleans Medical and Surgical Journal*, 1854–5, vol. xi, p. 783.

Dr. G. Ross: *South Clinic*, Richmond, Va., 1878–9, vol. i, p. 468.

Dr. W. C. T. Bates: Transactions, South Carolina Medical Association, Charleston, 1882, vol. xxxii, p. 105.

Dr. T. Dimon: *St. Louis Courier of Medicine*, 1882, vol. vii, p. 310–312.

Dr. H. J. Berkley: *Maryland Medical Journal*, Baltimore, 1882–3, vol. ix, p. 241.

Dr. Rudesindo Garcia Rijo: *Cron. med.-quir. de la Habana*, 1886, vol. xii, p. 388.

The *Lancet*, Nov. 2, 1889, pp. 922–970.

Dr. Ruiz: *Cron. med.-quir. de la Habana*, 1891, vol. xvii, p. 649.

Dr. S. W. S. Toms: *Medical News*, Feb. 24, 1894.

Appendix IX to the Final Report of the Royal Commission on Vaccination, 1897, Case X, p. 6.

Surgeon-General's Report, June 30, 1900, p. 205.

Surgeon-General's Report, June 30, 1900, p. 205.

Surgeon-General's Report, June 30, 1900, p. 206.

Dr. J. W. Findlay: *Lancet*, Feb. 22, 1902, vol. i, No. 8, p. 506.

Dr. R. N. Wilson: *St. Louis Medical and Surgical Journal*, April, 1902, vol. lxxxii, No. 4.

These occurred at somewhat remote periods in different parts of the country, and were all attributed to secondary infection of the wound. It would seem reasonable, therefore, to conclude that tetanus has not been a frequent and important complication of vaccination in the past, either in this or any other country. It may, however, be surmised that what is true at the present time has also

been true in the past, and that when tetanus occurred an attempt was made to suppress rather than publish it; if, however, any such occurrence of tetanus had taken place in the past as we have recently experienced, the medical literature would certainly contain some reference to it, as at present to the recent unpublished cases. For suppressed as they are at the present time, very few cases having been published in detail, rumors of cases and editorials referring to cases and speculating upon their occurrence are to be found in many of the journals. The lack of published information concerning the complication cannot depend upon failure to recognize it, as tetanus has been a well recognized disease for centuries, and indeed very little has been added to its symptomatology since the days of Hippocrates.

I have been able to collect a total of ninety-five cases. Throughout the paper I shall refer to *cases*, meaning by the term occurrences of tetanus that I have succeeded in authenticating, and of which I have considerable detail, while the term *rumor* will be used for cases of tetanus the occurrence of which seems certain, but concerning which, for various reasons, I have been unable to secure the details.

TABLE I.

Cases from the literature		15
Cases collected:		
a. With complete details	39	
b. With incomplete details	13	
		52
Rumors		28
		95

Fatalities	61
Recoveries	24
Unknown	10
	95

Adults	25
Children	45
Unknown	25
	95

Males	38
Females	29
Unknown	28
	95

The following table shows the chronological order of the cases I have succeeded in collecting. The large number of cases that occurred in the year 1901 indicates that some exceptional condition existed that changed an unimportant and infrequent complication into a very important and frequent one.

TABLE II.—TETANUS CASES, SHOWING CHRONOLOGICAL OCCURRENCE.

Chronology.	Cases.	Rumors.
1839	1	...
1878	1	...
1882	3	...
1886	1	...
1889	1	...
1891	1	...
1892	0	6
1893	1	...
1897	1	...
1898	3	2
1899	3	...
1900	1	...
1901	45	18=63
1902	5	1
Unknown date	...	1
	67	28
	28	
	95	

Month of appearance of symptoms of tetanus where exact dates could be determined.	
January	0
February	0
March	1
April	0
May	0
June	1
July	1
August	1
September	1
October	1
November	24
December	7

The occurrence of tetanus as a complication of vaccination has been variously explained as follows:

1. *That it is an accidental secondary infection of the vaccination sore.* Those holding this view think it depends upon conditions ever present and only to be expected, and that its occurrence is deplorable and preventable by the exercise of greater skill and caution in the performance of the operation and the subsequent treatment of the wound. That such a microörganism as the tetanus bacillus, whose natural habitat is the soil and which occurs widely disseminated in nature, might occasionally be able accidentally to find its way into vaccination lesions cannot be gainsaid. It is certainly possible, and may occasionally happen, but there are very cogent reasons opposed to this view, and to content oneself with such a simple explanation may be to fall into egregious error, for if tetanus can thus occur, it should do so in all parts of the world, with more or less regularity.

The various indices to the medical literature are without any references to cases of tetanus following vaccination in the continental countries. A communication from the Imperial Health Office of Berlin informs me that the complication is *unknown in the German Empire.* Letters from the Pasteur Institute at Paris, the Pasteur Institute at Lille, and the French Institute, inform me that the complication is *unknown in France.* No cases appear to have occurred in Italy, Russia, or Austria, so that we are engaged in the consideration of a complication that is chiefly American and has become important within a year.

2. *That the occurrence of the complication depends upon a local prevalence of the tetanus germs.* The epidemic in Camden has been attributed to germs in the dust of that city, supposed to depend upon a prolonged period of dry weather. This entirely fails to explain the matter, for were this the true solution we should find ordinary traumatic tetanus occurring more frequently than usual. This is, however, not the case, as aside from the vaccination cases there were fewer than the usual number of cases both in Camden and Philadelphia. Further, while it is true that a greater number of cases occurred in Camden than in other places of equal size, the occurrence of tetanus following vaccination has too wide a geographical distribution to be explained in this way.

TABLE III.—REPORT OBTAINED FROM THE CAMDEN BOARD OF HEALTH: DEATHS FROM TETANUS IN CAMDEN, N. J., FOR THE FOLLOWING YEARS:

	1901.	1900.	1899.	1898.	1897.	1896.	1895.	1894.	1893.	1892.	1891.	1890.
January	...	...	...	...	...	...	...	...	...	...	...	...
February	...	...	...	...	...	...	...	...	...	...	1	...
March	...	...	...	...	...	...	...	...	...	...	...	...
April	...	...	...	...	...	...	...	...	...	...	...	...
May	...	...	1	...	1	...	...	...	...	...	...	...
June	...	...	...	...	...	...	1	...	...	...	...	...
July	1	...	...	...	...	...	...	...	...	...	...	...
August	...	...	...	2	...	...	...	...	...	...	...	...
September	...	...	...	1	...	...	...	1	...	...	...	1
October	...	...	...	...	...	...	...	...	...	...	...	...
November	9	...	...	...	...	...	...	...	...	...	...	...
December	1	1	...	...	...	...	...	...	...	...	...	...

TABLE IV.—DEATHS FROM TETANUS IN THE CITY OF PHILADELPHIA.

BOARD OF HEALTH, ROOM 610, CITY HALL,
PHILADELPHIA, March 4, 1902.

Month.	1897.	1898.	1899.	1900.	1901.
January	6	5	...	4	3
February	1	4	3	1	1
March	4	2	2	3	...
April	1	1	...	4	2
May	1	4	3	3	1
June	3	3	3	1	1
July	1	1	10	6	6
August	3	1	7	5	1
September	3	1	3	1	2
October	1	3	5	5	5
November	1	2	2	1	4
December	3	2	3	3	3
Total	28	29	41	37	29

NOTE.—The differences between these figures submitted by the health authorities and the statistics are to be explained by the fact that some of the cases recovered and hence do not appear among the fatalities, and by the fact that some of the cases following vaccination were reported meningitis, etc., in order to escape observation.

Cases are reported from seventeen different States in the United States, from the Dominion of Canada, Porto Rico, the Philippine Islands, Cuba, etc.

That geographical conditions may exert a pronounced influence upon the occurrence of the tetanus, tetanus being particularly prevalent in certain districts. Thus, it is said that Cuba and Porto Rico have soils rich in tetanus bacilli, and that Long Island has a particularly dangerous soil. That such an influence is important is, however, very doubtful, as from these territories we have very few cases reported (3 Cuba, 3 Porto Rico, 2 Long Island). (See Table V.)

TABLE V. — TETANUS CASES, SHOWING THE GEOGRAPHICAL DISTRIBUTION.

	Cases.	Rumors.
Canada:		
Three Rivers, Quebec	1	...
St. John, N. B.	1	...
Connecticut:		
South Glastonbury	1	...
Cuba:		
Havana	3	...
England:		
Lancet	1	...
Commissioners' Report	1	...
Illinois:		
Chicago	0	1
Louisiana:		
New Orleans	1	...
Maine:		
Biddeford	1	...
Maryland:		
Baltimore	1	...
Massachusetts:		
Belmont	1	...
Cambridgeport	1	...
East Dennis	1	...
Boston	1	...
Michigan:		
Kalamazoo	1	...
Minnesota:		
Minneapolis	1	...
Taylors Falls	1	...
Missouri:		
St. Louis	0	1
New Jersey:		
Atlantic City	4	2
Bridgeton	1	...
Camden	11	...
Jordantown	0	1
Millville	1	...
New York:		
Albany	1	...
Long Island	2	...
Owego	1	...
Ocean:		
"City of Para"	1	...

	Cases.	Rumors.
Ohio:		
Cincinnati	0	1
Cleveland	4	...
Pennsylvania:		
Bristol	2	...
Easton	1	...
Girardville	1	...
Lyndell	1	...
Millbach	0	1
Philadelphia	11	12
Rosemont	0	1
Philippine Islands	1	...
Porto Rico	1	2
Scotland	1	...
South Carolina:		
Charleston	1	...
Tennessee:		
Paris	1	...
Unknown	0	6
Virginia:		
Richmond	1	...
Wisconsin:		
Milwaukee	1	...
	67	28
	28	67
	95	95

3. *That carelessness in the treatment of the vaccination wound is the source of the difficulty, because it facilitates accidental, secondary infection.* While this has a ring of genuineness about it, the argument is extremely unconvincing, if one take into consideration the fact that for one hundred years vaccinations have been performed with a total disregard to cleanliness and asepsis in all parts of the world, on all classes of people, in towns and cities, by careless and careful physicians, upon clean and dirty persons, that it has been unusual for any dressing to be applied in the past, and that during these many years tetanus has remained an almost unknown complication. We cannot conceive of any difference between the social conditions at the present and those of the past that are not immensely in favor of the present.

In our own country greater care is undoubtedly exercised at the present time than heretofore, and in those countries in which, because of ignorance and poverty, the same conditions prevail at the present time that existed a hundred years ago, as for example among the peasantry of Europe, we find tetanus practically unknown.

It is but now becoming recognized that vaccination is an operation, and that to free it from the common dangers of all operative manipulations, cleanliness and care are essential. We therefore find the skin cleansed and disinfected, and the lesion protected and dressed with a care never dreamed of a few years ago, yet when

we come to examine the details of those cases which have come within our knowledge, we find that this care of the wound appears to be without influence upon the development of tetanus, for while many cases have occurred among ignorant and filthy children, in an equally great number of cases not only ordinary but extraordinary care seems to have been exercised. Thus one case occurred in the person of an adult sister of a physician in Cleveland, Ohio. Both the patient and the operator were refined and cultured people, were apprehensive of the results, and exerted unusual precautions, yet despite all death from tetanus followed this vaccination.

The densely ignorant and filthy people of the island of Porto Rico, with no knowledge of hygiene or personal care of themselves, living in a place reputed to be extremely dangerous because of tetanus, were vaccinated by the United States authorities after the occupation of that territory, and out of some eight hundred and sixty thousand vaccinations three cases of tetanus, two of which are very doubtful, occurred.

4. *The use of a shield to protect the vaccination wound has recently become quite common, and has been blamed for the occurrence of tetanus.* It has, however, met with violent and perhaps justifiable condemnation on the ground that the pressure of the edges and of the adhesive plaster bandages by which it is held in place obstructs the lymphatic circulation and increases the severity of the wound and the danger of infection; also that the shield induces anaerobic conditions, so that by some the occurrence of tetanus has been blamed upon the shield. Upon looking over the cases reported, however, we find so few in which shields were used that they seem to have had no influence upon the occurrence of tetanus.

THE RELATION OF TETANUS TO THE VACCINE VIRUS.

With the evolution of vaccination as a prophylactic measure, certain changes in technique have been gradually introduced. Thus bovine virus has now displaced the arm-to-arm and human scab vaccination previously employed, and within the last quarter-century the use of the human virus has been almost entirely given up. Only a few of the early cases drawn from the literature followed the use of human virus. Can it be that the danger of tetanus has something to do with the employment of bovine virus? This seems possible when we consider that it is only in the last half-century that cases have occurred; yet this can scarcely be, inasmuch as bovine virus is the only form employed in Belgium, Germany, France, and other European countries, where we find no tetanus. While it is suggestive that the first tetanus cases reported in the literature

make their appearance about the time bovine virus came into general use, it is not true that the number of cases increased in proportion to the popularity of the bovine virus; for from 1854, when the first case made its appearance in the literature, until 1901, only isolated cases are reported, usually at intervals of years, a sudden extraordinary increase being observed in 1901.

The next step in the evolution of vaccination was the improvement in the quality of the virus, suggested by Copeman in 1891, by which glycerin was permitted to act for some time upon the virus, for the purpose of destroying microörganisms which it contained. By the use of the glycerin a bacteria-free virus can be secured. This improved virus made slow but steady progress, until at the present time it has attained to the greatest popularity and bids fair to replace all other forms. It is used almost exclusively on the continent of Europe, and has made very large inroads into this country.

The glycerinized virus is so new, having been in use but ten years and in common use little more than five years, that we are scarcely able to express a positive opinion regarding its advantages and disadvantages. The advantage of having the contaminating bacteria destroyed by the glycerin is indisputable; the disadvantage of occasionally having the glycerin act so long that the specific germs of vaccinia are killed and the virus made inert is also indisputable. That at times, when the demands upon the manufacturer are exceptionally great, the virus mixed with the glycerin might be placed upon the market before the necessary time for the contained bacteria to be killed had elapsed is a somewhat grave danger. These possibilities somewhat lessen the confidence with which the preparation is received and used by many practitioners.

When we come to investigate the cases of tetanus concerning which information is at hand, we are somewhat startled to find that a large number of them have succeeded the employment of this supposedly best and most refined preparation. This point will be discussed below.

TABLE VI.—SHOWING RELATION OF TETANUS TO MAKE OF VIRUS IN CASES IN WHICH THIS FACT COULD BE ACCURATELY DETERMINED.

	Dry.	Glycerinized.		Total cases.
		Points.	Tubes.	
E	3	10	17	= 30
A	2	...	...	= 2
D	...	...	2	= 2
W	...	1	...	= 1
S	...	...	3	= 3
I	1	...	...	= 1
G	1	...	...	= 1
	7	11	22	40

RELATIONSHIP TO PARTICULAR BRANDS OF VIRUS.

When an attempt is made to determine whether any particular brand or make of virus yields an unusually large number of tetanus cases, we find that while an occasional case of tetanus has succeeded the use of the virus of nearly all of the large manufacturers, the great majority of the cases have succeeded the use of a particular brand of virus.

The brands of virus to be considered are called E., D., A., S., W., I., St., and Wd. Those called E., A., and D. are the products of the largest manufacturers, and it is not improbable that they do about an equal amount of business, so that the figures in Table VI can be regarded as showing about the true proportion of cases to output. The other brands, W., S., I., and G., scarcely figure, G. being no longer made, I. not made in the United States, and S. having a much smaller capacity than E., A., and D. It is probably safe to say that these vaccines are all made under careful conditions, with the exercise of as great an amount of skill as can be exerted with our present knowledge. No care or expense is spared to have the products perfect. We find, however, a remarkable discrepancy in the results following their employment; a discrepancy that leads me to conclude that tetanus bacilli may be contained in the virus and distributed with it.

The occurrence of thirty cases of tetanus after the employment of virus E. suggests that in it tetanus germs were present in larger proportions than in any other, though the occurrence of only thirty cases following the use of millions of doses indicates that their number was small.

THE OCCURRENCE OF THE CASES IN GROUPS.

In this connection must be pointed out as interesting and significant the groups of cases that have occurred from time to time. Thus in Cleveland, Ohio, during 1901, we note the occurrence of four cases; in Camden, New Jersey, during October, November, and December, 1901, the occurrence of eleven cases; at Atlantic City about the same time, five cases; and in Philadelphia and vicinity, nearly at the same time, about twenty-five cases. A glance at Table II will show that the great majority of the cases studied occurred at about the same time. If we analyze these cases we find one vaccine (virus E.) chiefly if not exclusively implicated. The most instructive group of cases that I have been able to study occurred in the Men's Insane Department of the Philadelphia Hospital. In this institution with nearly four thousand five hundred inmates, there

was a threatened epidemic of smallpox depending upon the admission of a case of smallpox from the street. After one or two cases had developed within the institution, it was decided to vaccinate every inmate, and the resident physicians went systematically through the institution vaccinating sick and well alike. The institution was thus vaccinated with the exception of the Men's Insane Department, the greater number of whose inmates were obliged to wait a few days until a new consignment of virus arrived. With this new consignment (virus E.) they were then all vaccinated. Upon looking up the statistics of the hospital, we find that in the insane departments, male and female, no case of spontaneous traumatic tetanus had developed within twelve years. It is, in fact, not known that there has ever been a case of traumatic tetanus developed within the walls of the institution, but this cannot be determined, as the records prior to twelve years ago were destroyed by fire. Succeeding the vaccination, however, a group of tetanus cases, confined exclusively to the Men's Insane Department, occurred. Here five typical cases with trismus and opisthotonos and every marked symptom of the disease occurred, all being followed by death, four from the tetanus itself, and one from pneumonia, occurring immediately after cessation of the spasms. The occurrence of this outbreak occasioned much alarm, so that every suspicious vaccination wound observed was thoroughly excised and treated antiseptically. After this excision of the wounds *eleven additional cases* developed trismus and muscular rigidity, though after the administration of enormous doses of antitoxin they all recovered. In my statistics these eleven cases were considered as "rumors," as I did not consider the diagnosis above suspicion. In going carefully over the details of these cases, I find that with one doubtful exception every patient that developed tetanus was vaccinated with the same virus which had caused tetanus at Cleveland, Camden, Atlantic City, Philadelphia, and elsewhere (virus E.).

Should it be suggested that the occurrence of groups of cases depends upon the popularity of the virus in certain districts, as Philadelphia, Camden, Atlantic City, where it was almost exclusively used, and that in these districts some telluric, atmospheric, or other condition prevailed, causing them to be more predisposed to tetanus than the country in general, the idea should be at once dispelled by a few moments' consideration of the statistics presented. Thus if we deduct from the total thirty cases attributable to virus E. the six positive cases occurring in Camden, the seven positive cases occurring in Philadelphia, and the three positive cases occurring in Cleveland, there remain against this virus a total of fourteen cases, which is greater than the sum total of the cases referable to all the

other viruses produced in the country, thus showing that even where the cases are scattered and not in groups, virus E. has four times as many cases as any other single virus, and many more than all the other viruses put together.

Forty cases are presented (refer to Table VI) with exact information concerning the make and form of virus employed. Of these forty cases, *thirty* follow the employment of virus E., *ten* follow the use of all other forms combined, and no other single virus has a higher number than *three*. This seems to show quite convincingly that there is something about virus E. that is different from the others. We have in addition to these forty cases with complete details, eight cases in which it is known positively that one or the other of two viruses was used, but in which it cannot now be certainly determined which of the two it was.

TABLE VII.—CASES OF DISPUTED VIRUS WHERE NAMES ARE GIVEN.

Case Number. (Refers to unpublished list of cases.)	E.	A.	M.	W.	Wd.	St.
25	1	...	...	1	...	...
29	1	...	1	...	...	...
45	1	...	...	...	...	1
56	1	1	...	...	...	...
71	1	1	...	...	...	...
72	1	1	...	...	...	...
73	1	1	...	...	...	...
91	...	...	1	...	1	...
	7	4	2	1	1	1

We find that in the cases of this group vaccine E. figures in seven. If we assume, which it would be fairly justifiable to do, that all of these cases belong to E., then the disproportion is changed from E. thirty, to all others ten (30:10); to E. thirty-seven to all others eleven (37:11); thus making matters much worse. If, however, we proceed on the reverse order and admit that E. may be erroneously charged with these cases, we find the proportion E. thirty, to all others eighteen (30:18), so that matters are but little improved for virus E.

TABLE VIII.—TABLE OF COMPARISON.

Viruses.	Known.	Disputed.
E.	30	7
A.	2	4
S.	2	0
M.	3	2
W.	1	1
Wd.	0	1
St.	0	1
G.	1	0
M. I.	1	0

DRY AND GLYCERINIZED VIRUSES.

The respective influences of dry and glycerinized virus upon the causation of tetanus is shown by reference to Table VI, where we see that seven cases followed the use of dry points, eleven the use of glycerinized points, and twenty-two the glycerinized tube virus. This proportion, seven to thirty-three, appears to be couvincingly in favor of the dry virus, but we find the error caused by virus E. All three forms of virus E. have been followed by tetanus in the respective proportions of dry points three to glycerinized points ten and glycerinized tube virus seventeen. If we entirely omit virus E. from the consideration, we find the totals of all other viruses to be:

Dry points	4		
Glycerinized points	1	=6	= 2:3
Glycerinized tubes	5		

The proportion of four dry to six glycerinized being about correct when we remember that the glycerinized is the popular virus at the present time.

This seems to show pretty well that there is little general disproportion in favor of dry over glycerinized virus as regards the occurrence of tetanus.

THE SOURCE OF THE TETANUS BACILLI IN VIRUS.

When we consider the distribution of the tetanus bacillus in nature, we find it in the soil, chiefly where it has been well fertilized. The tetanus bacilli are, no doubt, frequently swallowed by herbivorous animals in browsing upon the surface of the ground, and the anaerobic conditions for its growth being excellent, we find that the intestines of herbivorous animals commonly contain large numbers of them, and that with the intestinal evacuations they are deposited again upon the soil in increased numbers. The first source of danger, therefore, by which vaccine virus can be contaminated is the manure of the calf, the next source the dusts arising from the dry manure and the soil, both of which may be brought into the stables with the hay or upon the animals.

When large hay-fed animals are employed for the manufacture of virus, the manure is certainly a source of danger, but in stables where sucking calves are used for the purpose, fewer tetanus bacilli are present in the excrement. However, Huddleston found them present in the feces of eight per cent of the small calves used in the laboratory of thé Health Department of New York.

It is evident that from these sources opportunities for the entrance of tetanus germs into the vaccine virus occur, and as a matter of fact they have been found in the virus on one occasion

only. The first discovery of tetanus bacilli in commercial vaccine virus having been reported to the Philadelphia County Medical Society, on April 23, 1902, by Dr. R. M. Willson. This indicates that their number must be very small, so that in the distribution of the virus in tubes and on points, hundreds or thousands of tubes escape where one is contaminated. It is probably because the number of organisms is so small that so few infections occur.

THE INCUBATION PERIOD.

The period of incubation of ordinary traumatic tetanus varies from a few hours to several weeks (see Chart A).

CHART A.—PERIOD OF INCUBATION OF TRAUMATIC TETANUS, BASED UPON THE STUDY OF 397 REPORTED CASES OF TRAUMATIC TETANUS.

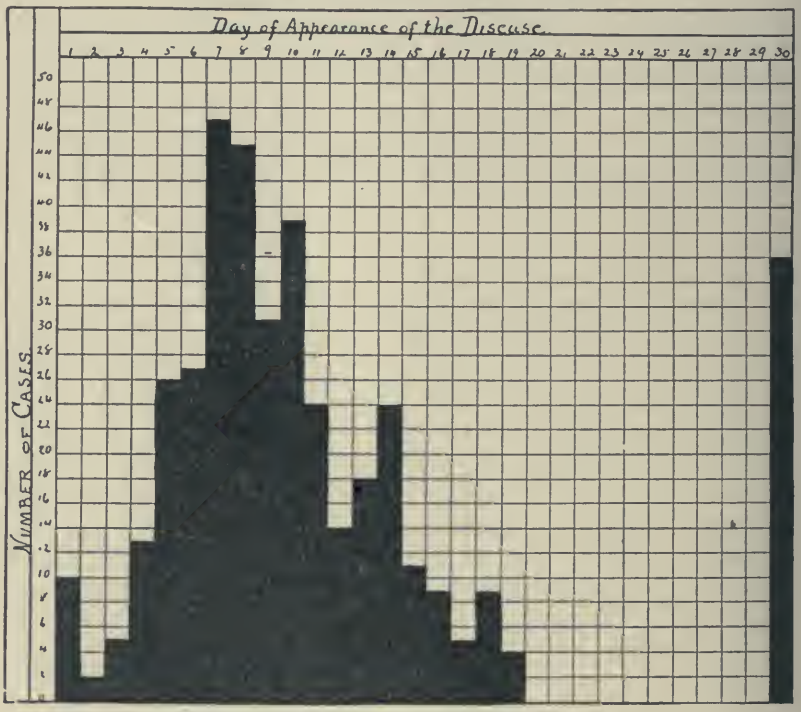


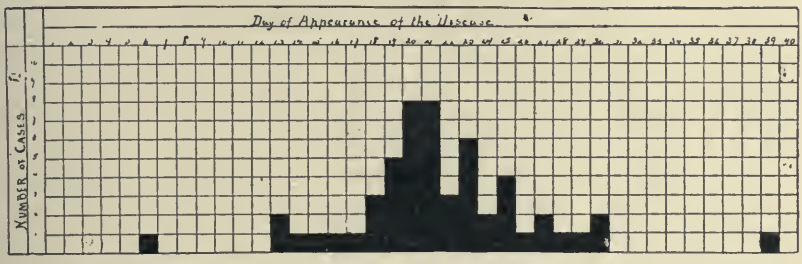
TABLE IX.—TETANUS CASES, SHOWING INCUBATION PERIOD.

Shortest period	6 days.
Longest period	39 days.
Average	22 days.

1. For points—	Shortest period	30 days.
	Longest period	16 days.
	Average	23 days.
2. For gly. virus—	Shortest period	6 days.
	Longest period	39 days.
	Average	22 days.

The usual incubation period varies from seven to nine days. In the vaccination cases—that is, in cases of tetanus following vaccination—we find the shortest period of incubation to be six days, the longest thirty-nine, the average twenty-two days (see Chart B). It

CHART B.—PERIOD OF INCUBATION OF TETANUS FOLLOWING VACCINATION, BASED UPON THE STUDY OF 54 CASES.



is thus seen that tetanus following vaccination appears on the average about two weeks later than ordinary traumatic tetanus. This is the sole weakness in the argument, and I think if this error could be eliminated it would at once be conceded that the remaining facts are indisputable. The late appearance of the symptoms is usually interpreted that the infecting organism entered the vaccination wound at a time when it was open, exposed and subject to secondary infection from the air, water, clothing, etc., with which it comes in contact. In truth, however, how rarely do superficial ulcerations become infected with tetanus! Did any one ever hear of a sudden paroxysmal outbreak of sixty-three cases of tetanus in one year following the infection of leg ulcers, furuncles, mosquito bites, and other *superficial* lesions, even when cleanliness was not observed?

I think after the statistical demonstration that this secondary infection theory must be looked upon as a misinterpretation when applied to the cases of 1901, although it may occasionally occur and explain the rare cases of previous years. The fact probably is that the tetanus bacillus is ingrafted into the skin at the time of vaccination, but fails to find suitable conditions for its growth until after the development of the vaccine lesion paves the way by the local destruction of tissue. This makes us add to the usual incubation an additional period (a couple of weeks) during which the wound has been prepared for the implanted organisms, thus bringing the entire period to the length usually observed in the vaccination cases. An examination of Table IX shows that no difference exists between dry vaccine on points and glycerinized virus regarding the length of the incubation period.

In nearly every case in which I have succeeded in securing details, I learned that the vaccination "took well." This may not

be without significance, though it may be interpreted in several ways. It may mean that those vaccinations in which marked local lesions occur are those in which secondary infection has the best chance of occurrence. If so, it means that severe vaccination lesions are dangerous, and that mild viruses should be used, the multiple insertion of a mild virus being preferable to a single insertion of an active virus. It may also mean that the lesion was caused by an impure virus, in which tetanus might be contained as well as other organisms. Lastly, and I think truly, it may mean that it is only when destructive local lesions occur that the implanted tetanus bacilli can find conditions suitable for their development.

Reference is again to be made to the chronological development of the cases, by which it will be observed that the majority of cases occur at a time when, because of agitation concerning smallpox, the demands for virus are great. This being the case it is not impossible that vaccine viruses are sometimes marketed a little anterior to the time when the action of the glycerin has extinguished the life of the bacteria in the virus.

CONCLUSIONS.

From the foregoing the following conclusions seem justifiable:

1. Tetanus is not a frequent complication of vaccination, a total of ninety-five cases having been collected.

2. The number of cases observed in 1901 was out of all proportion to what has been observed heretofore.

3. The cases are chiefly American and occur scattered throughout the eastern United States and Canada.

4. They have nothing to do with atmospheric, telluric, or seasonal conditions.

5. They occur in small numbers after the use of various viruses.

6. An overwhelming proportion occurs after the use of a particular virus.

7. The tetanus organism may be present in the virus in small numbers, being derived from manure and hay.

8. Occasionally, through carelessness or accident, the number of bacilli becomes greater than usual.

9. The future avoidance of the complication is to be sought for in greater care in the preparation of the vaccine virus.

A complete list of the cases, with the particulars from which the above conclusions are drawn, is in my possession, though the fact that much of its most important information was given me in confidence prohibits its publication. To any one interested in any one of the cases I will be glad to furnish all that I know.

THE TECHNIQUE AND POSSIBILITIES OF ENDOVESICAL OPERATIVE PROCEDURES.

BY LOUIS E. SCHMIDT, M.Sc., M.D., CHICAGO,

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The Bottini operation and the catheterization of the ureters have been extensively discussed in the past few years. Strictly speaking, these procedures do not belong to the class of operations under consideration, and for this reason I will not discuss them, but will confine this paper to those operative interferences which are performed inside the bladder, under the guidance of the eye, without any previous cutting operation, which is done for making the interior of the bladder accessible. In other words, operations which can be performed with the aid of instruments, which allow of the inspection of the affected areas of the bladder wall, and at the same time admit of the introduction of mechanical appliances which are used for the different operative procedures. These systems of instruments are called operative cystoscopes. Three distinct types of instruments are distinguished from each other.

Not to go into detail, but simply to mention their important points, and thus show their differences, it will be necessary to enumerate:

1. Nitze operative cystoscope. Here the lamp, prism, and window are on the concave surface of the beak. In front of the space between the lamp and the window the operative appliances are placed; in fact, the operative appliance carries in its hollow shaft the optical apparatus. The latter is movable, so that the operative appliance can be brought to different distances and positions from the cystoscope part. These mechanical appliances are galvanocaustic snare, cautery, small forceps, and lithotriptic forceps.

2. Casper operative cystoscope differs from the Nitze cystoscope in that the lamp, window, and prism are on the same plane, so that the whole optical apparatus is straight. The operative part is practically similar to the Nitze.

Both of these cystoscopes compel the operator to work under indirect vision.

3. Kolischer operative cystoscope. With this cystoscope the operator works under direct vision. The lamp and window are situated on the convexity of the beak. To the under part of the cystoscope is attached a canal, through which the different instru-

ments are introduced into the viscus. Their working end appears just below and in front of the window.

Considering the merits and demerits of these types, it may be stated that the beak of the Nitze instrument is somewhat bulky and clumsy, because in the beak the operative appliance and lamp are in contact, and must be introduced together. This is avoided in the Casper instrument, as the mechanical appliance is first independently introduced; furthermore, the canal of this part is wide enough to allow of thorough flushing of the bladder between the operative stages. On the other hand, the Nitze instrument is more simple, so far as its mechanical settings are concerned. Both instruments have the drawback that the operative beak covers, to a great extent, the field of operation. It has to be admitted that these two types, by permitting of the use of powerful instruments, allow of very energetic and extensive procedures.

The Kolischer cystoscope has the advantage of direct view, and that, in consequence of its construction, the working end of the mechanical appliances does not interfere with the clear view of the field of operation. Another advantage is to be found in the variety of instruments. While this instrument also allows the use of both galvanocaustic snare and cautery, it is the only operative cystoscope which permits of the use of curettes, scissors, forceps used for picking up and removing small foreign bodies. But in order to keep the circumference within reasonable limits, it has but a small lumen, so that the usefulness of this instrument is somewhat limited by the small dimensions of the mechanical appliances.

I refrain from giving a minute description of the details of construction, which can be more readily understood by examining the instruments I wish to demonstrate.

In passing, it is best to mention that Mirabeau and Latzko constructed small appliances which can be introduced into the bladder independently of the cystoscope, and used under the control of the cystoscope. The limited usefulness of these devices is further reduced by the fact that they are only to be used in the female bladder. The same holds good of the Kelly instruments, which do not approach the perfection of the modern cystoscope.

An important question is the one of anesthetics, because a large number of individuals having bladder affections have also kidney diseases, and for this reason it is best to avoid general anesthetics, if it is possible.

It is a fact that most of these endovesical operations can be done under a carefully given local anesthetic. The correct application of

a local anesthetic is a necessity. It is best to state at once the great danger of cocainization of the bladder. As a local anesthetic, a highly concentrated antipyrin solution is to be recommended. It must not be forgotten that it requires ten minutes or even longer until antipyrin gives the desired effect, hence must be done at the proper time. The urethra should be anesthetized by cocainization. While it is easy to do this within the pendulous urethra, it is best to apply cocaine into the posterior urethra with the Ultzman capillary catheter. After injecting along the entire urethra, the external urethral orifice is held fast to prevent the escape of the cocaine solution, and the entire urethra is massaged, so as to bring the solution into intimate contact with the mucous membrane of the entire urethra. The disagreeable sensations in the prostatic urethra, caused by the stretching of the deeper layers, cannot be overcome by the superficial cocaine anesthesia, but must be overcome with a morphine and atropine rectal suppository.

Previous to any operative step, it is advisable to have the bladder in as good a condition as it is possible to bring it with the usual irrigations, instillations, and internal medications. This procedure not only makes the bladder less sensitive, but also brings the localized centers of the pathological changes into prominence.

One of the most frequent indications for this method of treatment is the stubborn cases of cystitis. Under this is comprised not only the inflammation of large areas, but also small localized inflammation, as fissures, ulcerations, and remnants of cystitis, where the adjacent parts are free from pathological changes. Granulating cystitis is not an uncommon condition, and I wish to state most emphatically that these cases do not respond to the ordinary treatment, but require surgical intervention. The method of procedure is to remove these granulations by curettement, and the method of choice is with the aid of the operative cystoscope. The subsequent hemorrhage is, as a rule, exceedingly slight. If of any severity, nitrate of silver irrigations will cause it to subside. It is my routine to inject, and to leave in, iodoform emulsion after such curettage, on account of the antiseptic and soothing effect.

Fissures which, if located in the bladder neck, cause very annoying symptoms can readily be healed with a single treatment consisting of an energetic cauterization.

A very important chapter to vesical diseases is the ulcer which follows a gonorrheal cystitis. The frequency of these and the importance of their treatment have become more recognized since systematic cystoscopy has been practiced amongst genito-urinary

surgeons. The coating and the granulations which cover it must be thoroughly curetted, and prompt cure follows. It has become recognized that patients of this class can be treated for years without any results, and one single treatment with the operative cystoscope will cure these individuals.

The standpoint of the endovesical operator toward tumors of the bladder should be carefully discussed. Nitze claims that even malignant tumors ought to be operated with the operative cystoscope, pointing out that definite results, even after suprapubic cystotomy and extensive resection are far from satisfactory, and that even large malignant tumors can be removed by the galvanocaustic snare, down to their bases. This standpoint is certainly not approved of by the large majority of surgeons. Under our present view malignant tumors will always call for radical operations after cystotomy. It must be mentioned, however, that if these cases are beyond operation, or refuse such a step, an endovesical cauterization often gives great relief, especially after necrosis has set in. This interference can be repeated, if necessary. I think the proper limitation for the operative cystoscope in cases of tumors is furnished by the following points: The tumor should show no signs of malignancy; it should not be so large as to interfere with the ease of manipulating the cystoscope; it ought to be pedunculated, although it has to be admitted that even tumors with a large base can be removed, in sections, with the operative cystoscopes. It is remarkable how large pieces can be removed by the evacuator, by first cutting them with cystoscopic scissors. There are benign tumors which become encrusted to such an extent that they cannot be operated with the operative cystoscope, for they are too hard, but must be removed by resection of the bladder wall.

Nodular varicosities of the superficial veins, which give rise occasionally to severe hemorrhages, are easily removed by cauterization with the galvanocautery.

Small foreign bodies and immigrated ligatures, needles, and hairpins have been repeatedly removed by means of the operative cystoscope. Foreign bodies of some considerable size should not be thus removed, on account of the unnecessary traumatism.

The operative cystoscope plays an important rôle in the after-control of litholapaxy. The cystoscope makes possible the minute and exact supervision of the bladder, and the small lithotriptor or forceps of the operative cystoscope is a reliable means of crushing small splinters and removing them. The latter procedures are more important if the sharp splinters become embedded in the bladder

wall. This condition is very dangerous, because of the imminent possibility of perforation and suppuration, while even a powerful pump will not remove them.

Although I have given but a short sketch of the more important operative interferences, I hope it has been of sufficient detail to impress all with the advantages of these procedures. I have attempted to give the fairly exact limitations, and have not been too enthusiastic in advocating its general adoption.

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A CASE OF CHRONIC POLYARTHRITIS.[1]

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Just as it became necessary, early in the last century, to make a distinction between typhus and typhoid fever, there is now accumulating evidence that we shall have to differentiate the latter into several possibly distinct affections. Clinicians have, from time to time, called attention to cases that, while they could not be classified under any other heading, did not fit under that of typhoid fever. The introduction of the serum-agglutinating test has contributed to greater accuracy in this connection. While in the present state of knowledge this test cannot be considered infallible, it must be looked upon as specific, and its occasional absence in cases of apparently true typhoid fever and its rare presence in cases apparently not of typhoid fever may be due to qualitative and quantitative conditions concerning which the future may bring definite knowledge. In some of the cases of the first group it has been possible to cultivate from the blood or the intestinal discharges microörganisms differing in several essential particulars from the typhoid bacillus, but undergoing agglutination with blood from the patient in question. For this group of microörganisms—there seems to be more than one—and for the disease or diseases to which they give rise, Dr. S. J. Meltzer (*New York Medical Journal*, Jan. 25, 1902, p. 138), following Schottmüller, proposes the name paratyphoid.

With regard to the pathological anatomy evidence is yet wanting, as death has not occurred in any of the cases studied. Infection with paratyphoid bacilli does not preclude simultaneous infection with true typhoid bacilli, and *vice versa;* and to such mixed infection may be attributed some of the anomalous serum-reactions that have been observed.

In the same way as we have thus come to differentiate typhus and typhoid, and to subdifferentiate the latter, we are learning daily to differentiate more clearly rheumatic and rheumatoid affections. The time has come when it must be recognized that arthritis, single or multiple, may be of varied origin. The predisposing causes are many, but the exciting causes are essentially if not exclusively microörganismal. Among the many forms of arthritis there is one

[1] Presented to the Section on General Medicine of the College of Physicians of Philadelphia, March 10, 1902.

distinct variety, probably dependent upon a specific bacterium, to which alone, it seems to me, the designation acute rheumatism or rheumatic fever should be given. This etiologic rôle has been assigned to several microörganisms that have been isolated by different investigators from the lesions of the disease. Not the least likely of these is that described by Poynton and Paine (*Lancet*, Sept. 22 and 29, 1900, and May 4, 1901), which complies with the bacterial requirements for the establishment of specificity. So much then for acute arthritis.

The difficulties as to the etiology and nature of the chronic forms are greater rather than less. In some instances the chronic disease represents the results of an antecedent acute process, of single or of repeated occurrence. In others it is insidiously progressive. Whether in any event it can be considered rheumatic in the stricter sense in which I would prefer to employ that term seems at least doubtful. We can more readily conceive of it as due to some slowly operating toxic process, whether of bacterial or of metabolic origin. We have already learned to separate deforming arthritis from rheumatic affections, and the independence of the trophic disorders of the joints attending various diseases of the nervous system has in the course of time become more clearly recognized. Schüller (*Berliner Klinische Wochenschrift*, Nos. 5, 6, 7, 1900) has described as a distinct affection, dependent upon a specific microörganism, a morbid process attended with hyperplasia of the articular synovial membrane, and to which he has given the name of chronic villous arthritis.

I wish to report a case of chronic multiple arthritis that does not seem to fit exactly into the description of any of the commonly observed forms of that disorder, although it presents most nearly the appearances and features of deforming arthritis.

M. M——, an unmarried white woman, 31 years old, engaged in housework, presented herself at the Polyclinic Hospital with tumefaction in varying degree of the metacarpophalangeal joints of all of the fingers of each hand, yielding a sense of elastic fluctuation on the dorsal aspect. Distinct grating was appreciable at the metacarpophalangeal joint of the left index-finger on movement, and slight grating at some of the other metacarpophalangeal joints. A few of the interphalangeal joints were enlarged and presented a spindle-shaped appearance. There was a little overextension of one or another of the phalanges. The intrinsic muscles of the hands were slightly wasted, and the hands exhibited a tendency to ulnar deflection. There was also multinodular swelling of the posterior aspect

of the olecranon process of the left ulna, and a smooth swelling in each popliteal space and on the dorsal aspect of each wrist. There was further some enlargement of the metatarsophalangeal joints of the first and fifth toes of each foot, and restrained movement at the right ankle-joint. The movements of the jaw were free. Station was steady. The knee-jerks were preserved. The pupils were equal, of good size, and they reacted to light. Sensibility was preserved, and the patient was able to distinguish heat and cold.

The patient had never had an attack of rheumatism. Nine years previously, following the death of her father, she was seized with aching pain in the feet, knees, and wrist, which had persisted in varying degree since. Two years later the ankles became swollen, but the swelling in these parts subsided gradually in the course of three or four years, and is not now present, although, as noted, there is some interference with movement at the right ankle. Shortly after this, swelling of the hands appeared, which was considerable at first, but this gradually subsided until the parts attained approximately their present condition. The patient states that she was strong and healthy as a child. She had had an attack of whooping-cough complicated by pneumonia at the age of 7, and an attack of measles at the age of 12. At the age of 26 she had had several carbuncles. She was for eight years until several years ago a box-maker. She suffered from gastrointestinal derangement, with coated tongue, impaired appetite, flatulence, acid eructations, and constipation, and she complained of occipital headache, pain in the right ovarian region at the menstrual period, chilliness, sweating, and undue readiness of fatigue. The action of her heart was rhythmic, the sounds clear. The urine was free from albumin and sugar. The father died of diabetes at the age of 48, after an illness of but six weeks. The mother is still living, and complaining of headache, backache, and indigestion. Three brothers are living and well. One of them has had two attacks of acute rheumatism.

THE PREVENTION OF CONCEPTION—A CRITICISM OF SOME METHODS.[1]

BY G. KOLISCHER, M.D., CHICAGO, ILL.

The prevention of conception is not only a sociologic problem of importance, but it is of interest in a medical sense. I shall not refer to operative measures for sterilizing women, but only discuss the mechanical devices for preventing conception.

These can be divided into two groups—one used by men, the other by women. The latter are of greater medical interest because of their increasing popularity and their influence on the general health. These devices are constructed after the manner of a pessary, and are intended to grasp the portio vaginalis in such a way as to occlude the external os and prevent the entrance of the spermatozoa into the uterus.

In preventing conception these devices are unreliable, as a skilled hand is required to place them in proper position. Their supposed efficacy is enhanced by the fact that they are used by individuals whose intercourse is sterile, from occluded tubes, endometritis, epididymitis, or prostatitis. But these considerations are of only individual interest. The fact that these devices may be dangerous to both parties gives the subject a general medical interest.

The occlusive pessaries used in preventing conception consist of a rubber ring with a central diaphragm, the latter modified in various ways, or the whole pessary is formed of soft rubber, in the form of a cap with a thickened rim, the latter firmly grasping the cervix. As a rule such pessaries are inserted after the menstrual period and left in position until the next menstrual flow. This practice is a menace to the health of both sexes. Gynecologists know that certain vaginas do not tolerate soft rubber; it causes an intense congestion with profuse secretion.

Pathogenic germs are always present in the vagina, but their virulence and viability are greatly reduced. A change in the environment alters their virulence; in a few generations they may become so virulent as to excite an inflammation which varies in character with the germ. A copious catarrhal secretion may undergo decomposition when retained and awake the potential virulence of these germs. Such an altered secretion may infect the male urethra, or cause an ascending inflammation of the female pelvic organs. Such cases have been observed in which gonorrheal

[1] Read before the Chicago Medical Society, May 16, 1902.

infection could be certainly excluded. I append a few cases which support these views.

The wife of a physician married for eight years had borne three healthy children, when one of the above mentioned contrivances was used. The husband, perfectly familiar with the modern professional views concerning gonorrhea, and aware of the importance of truth in this matter, emphatically denied ever having had any infection. He willingly submitted to all kinds of examinations, which proved the truth of his statements. I had occasion to examine the wife repeatedly and carefully, as I conducted all the confinements. Never up to the time of the above mentioned incident was there any infection. The soft-rubber cap was introduced after menstruation and kept there until the next period, and daily irrigations were used. In the second month of the use of the pessary the wife noticed a rather offensive discharge, while pain in her right side set in. Shortly afterward the husband appeared in my office very much concerned, having noticed a purulent discharge from the urethra; this discharge appeared the day following the last intercourse. The pain during urination was slight. That the urethritis was not gonorrheal was proven by microscopic and culture tests. The short incubation and the disappearance of the discharge inside of a few days without treatment confirmed the diagnosis of a non-specific process. The examination of his wife showed a typical vaginitis with a copious cream-like secretion. In removing the cap, quite an accumulation of pus in its cavity was found. Cervicitis was present, the right parametric tissue infiltrated and sensitive, the right ovary enlarged and painful. The removal of the pessary and antiseptic flushings and the four times repeated cleaning of the cervix with formalin caused the prompt disappearance of all symptoms.

In the second case the husband married after a successful treatment and a cure of chronic gonorrhea. The wife became pregnant shortly after the wedding, and in due time was delivered of a healthy child. Labor and lying-in period were uneventful, and husband and wife enjoyed perfect health until about half a year after the confinement, when the use of a preventive soft-rubber pessary was commenced. After this pessary was in the vagina for about three weeks, the husband was suddenly attacked by urethritis. The accused intercourse took place about twelve hours before the discharge was noticed. Examination of the woman revealed copious discharge from cervix and vagina, erosions on both lips, and a change of the cervical mucous strand to a yellowish mass. Search

for gonococci gave a negative result. The discharge from the male urethra proved non-gonorrheic, but extension of the inflammation to the posterior urethra and prostate set in the week after the first symptoms appeared, and it took four months to cure the patient. All the time microscopical examinations and culture tests failed to show gonococci. The extension of the inflammation to the posterior urethra and appendages is somewhat similar to the well known phenomenon, that every time a gonorrheal reinfection takes place the posterior urethra becomes involved. This incident proves at the same time how serious even a non-specific purulent infection of a urethra is, which has once been subject to gonorrhea. The symptoms in the woman were mild and subsided under antiseptic flushings and ichthyol.

In the third case both marital partners have had a chronic gonorrhea. The husband has shreds in the urine, mostly consisting of mucus and a few pus cells. Gonococci show up occasionally, especially after alcoholic excess. The symptoms in his wife did not exceed the presence of a chronic urethritis and cervicitis. In the secretions of both gonococci could be found. Repeated bimanual palpation failed to reveal changes at the uterine appendages. Both parties felt quite comfortable until the husband, in order to get rid of the frequent urinary calls, underwent an energetic treatment of his chronic gonorrhea. This treatment, consisting in dilatations, instillations, etc., cured, according to his physician's opinion, the chronic process. The husband, afraid on account of his improved condition that his wife might become pregnant, following the suggestion of his family physician, had his wife use a soft-rubber pessary. In about six weeks the wife was taken with a serious attack of inflammation of the uterine appendages and pelvic peritonitis. She said in her history that shortly after the pessary was inserted she noticed an increase of leucorrhea, which inside of two weeks turned into a yellowish flow. The conclusion seems not far-fetched that the irritation of a foreign body helped along the development of an ascending gonorrhea, or may be that a "mixed infection" took place on account of the decomposition of the retained secretion.

To sum up the prominent features of these cases, which are reported at some length, because they are the most typical and best observed of a series of similar cases, I may say this: The use of soft-rubber caps as preventive pessaries is always a dangerous measure. The practice of leaving it in the vagina during the interval between two menstruations is to be condemned. If they are used at all, they must be removed at short intervals and effective antiseptic douches

should be regularly employed. These rubber caps may produce inflammatory catarrhs in pelvic organs that have never been attacked by a specific infection. The secretion of such inflammation may cause a non-specific urethritis in the male. These pessaries are especially dangerous in cases in which the tissues are weakened and made susceptible for new infection by a previous gonorrhea, and they are apt to increase the virulence of a latent gonorrhea.

A CASE OF BOTHRIOCEPHALUS LATUS.[1]

BY JOSEPH McFARLAND, M.D.

The following case of bothriocephalus infection is of interest not only because of the rarity of the parasite in this country, but because it opens the way for some interesting speculations concerning the age that these parasites may attain and the variations in the rapidity of their growth.

Mr. S. A. L——, a Jew aged 22 years, unmarried, born in Kurland, Russia, a medical student, came to this country eight years ago (1894). Sixteen years ago, when the patient was six years old, he passed four or five yards of tapeworm upon two different occasions. His grandfather, who was a physician, examined the segments and told him that the tapeworm living in his intestines was a "fish worm" of a not uncommon kind in that part of the country, and one that was hard to cure. He prescribed vermifuges and cathartics, which caused the removal of several more yards of worm. The boy was made ill by the medication, and it was not repeated. However, from that time no signs of the worm appeared, and six or seven years passed, during which time it was believed to be dead.

The patient had been in this country but a short time when, after having eaten of an unusual food, which caused rather active diarrhea, he was astonished to find in his feces a considerable piece of tapeworm, consisting of the larger segments. Nothing was seen of the worm for six months or more, when about a yard or two was passed upon a similar occasion; and from this time on the patient says that once or twice a year, usually in the spring and autumn, always at times when there was a change in the family table, depending upon the advent of fruit, berries, and other vegetable foods, sometimes a yard or two or several yards of the worm was passed.

During all the years since he became host to the parasite, the patient has never experienced any unpleasant sensation, any illness, or anything to call his attention to the fact that he is the host of a tapeworm. The last piece of tapeworm was passed after an interval of one and a half years, during a mild attack of diarrhea. Since the passing of this fragment the patient has taken a number of very active vermifuges, followed by powerful cathartics, but has not passed any other segments of the worm. The patient is below

[1] Presented to the Pathological Society of Philadelphia, February, 1902.

normal stature, his complexion is pale, contrasting with the very dark hair and eyes of his race. He is slight but not feebly built, and considers himself to be in perfect health. An examination of the blood made in the Clinical Laboratory of the Medico-Chirurgical College gives the following result: Hemoglobin, 80 per cent; erythrocytes, 4,760,000; leucocytes, 8600.

The examination of the worm confirms the diagnosis made by the patient's grandfather so many years ago, and shows it to be the *Bothriocephalus latus.*

It would be interesting to know whether the worm, whose segments are periodically passed at the present time, is the same worm originally seen by the patient's grandfather sixteen years ago, or whether that worm was killed as a result of his medications, passed unobserved, and the present worm another subsequently developed in the patient. It seems rather remarkable that the parasite should remain unnoticed for seven years, yet the subsequent history that fragments of the worm are passed only at intervals varying from six to eighteen months shows it to be of very slow growth, while the good health enjoyed by the patient and the result of the examination of his blood would indicate that the worm was not very active.

Upon carefully questioning the patient concerning his habits, it was learned that raw fish is not eaten in the part of the country from which he comes, unless it be well smoked, and that of smoked fish, especially herring, considerable quantities are consumed.

Very little accurate information bearing upon the subject of infection could be secured from the patient, so that nothing more can be said about it than that it probably resulted from eating smoked fish. It has been shown by numerous investigators that smoked fish may contain the live embryos of this worm, and that for their destruction a more considerable heat than that generated by the smoke fires is necessary.

It is of course well known that the Bothriocephalus is a common parasite in Sweden, Norway, Russia, and the countries about the Baltic Sea, and as the grandfather of the patient said, when the parasite first made its appearance, it was in the form of tapeworm quite common in that part of the country.

THE DIAGNOSIS OF CHOLECYSTITIS.[1]

BY JOSEPH SAILER, M.D.,

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The diagnosis of cholecystitis is ordinarily one of the most difficult problems presented to the clinician. Quincke and Hoppe-Seyler, who have written the most extensive modern monograph upon the diseases of the liver, state that in the majority of cases cholecystitis is either not recognized, or incorrectly diagnosed, and this may be said to be the general experience. I think it is safe to say that in the majority of hospitals an approximate diagnosis only is attempted, and too frequently when a case results fatally an autopsy either is not obtained, or else the clinician familiar with the symptoms is not present to direct the pathologist what examinations to make in order to find explanations for them. Fortunately there is reason to hope that in the course of time this difficulty will be partially obviated by the fact that the gall-bladder and bile-ducts are becoming more and more accessible to surgical measures, and therefore we may expect that in time the operation, which is often better for the sake of confirming or disproving the diagnosis than an autopsy, will enable clinicians to arrive at a degree of accuracy equal to that now attained in the diagnosis of appendicitis. At the present day the reasons for the difficulty of the diagnosis in these conditions are as follows: First, that the symptoms are exceedingly variable; this of course is perhaps due to the fact that the symptoms of inflammation are variable, and that the microörganisms which may produce inflammatory conditions are numerous, and it is possible that they give rise to slightly different symptoms, at least to different degrees of inflammatory reaction. Secondly, many cases are latent, a fact to which Minkowski calls particular attention, or at least give rise only to general manifestations. Thirdly, and more important than this variability in the manifestations of cholecystitis, is the fact that other disease processes in the abdominal cavity give rise to symptoms that are indefinite, or not sharply localized, and are capable of being mistaken for affections of very different structures. The differential diagnosis, for example, between appendicitis and cholecystitis may be so difficult that even those with the greatest experience are liable to error. In fact, there is some reason to believe that the greater the experience the greater the doubt that may exist in the

[1] Read before the Philadelphia County Medical Society, April 16, 1901.

mind of the diagnostician, because he thereby becomes acquainted with the possibilities of variation in the manifestations of either disease. The obscurity is even more pronounced in cases of disease of the right kidney, or in inflammatory disease of the liver, or of the peritoneum in the neighborhood of that organ. In some cases even acute pancreatitis may simulate biliary disease so closely that the differential diagnosis is almost impossible. Finally, conditions may arise in the intestinal tract, particularly in the upper portion of the small intestine, which may cause considerable uncertainty, especially as enteritis in those situations is so frequently associated with disease of the bile-ducts.

It will be impossible, in the limits of this paper, to enter upon any adequate discussion of the differential diagnosis of cholecystitis from conditions that may be mistaken for it. It will perhaps be better to present as clearly as possible the symptomatology of a typical case of acute suppurative cholecystitis, and to indicate the chief variations from this type.

From time immemorial jaundice has been considered characteristic of liver disease. Presumably in all forms of simple catarrhal cholangitis there is an inflammatory swelling of the mucous membranes of the biliary passages and of the gall-bladder. This gives rise to the characteristic yellow color of the skin and sclera, the presence of biliary salts in the urine, clay-colored stools, a slow pulse, itching skin, mild digestive disturbance, and slight fever. The symptoms are usually characteristic and the diagnosis easy. The course of the disease is mild and the prognosis favorable. When, however, there is reason to suspect some active inflammatory process, particularly if it is associated with empyema of the gall-bladder either as a result of direct infection or on account of the presence of a stone, the diagnosis becomes much more difficult. The disease may commence with all the symptoms of peritonitis, and as a matter of fact peritoneal effusion may be found at operation or autopsy before perforation of the wall of the gall-bladder or biliary ducts has taken place, as in the case reported by Imhofer. The patient may suddenly go into a state of collapse and die before the real nature of the disease is suspected, or there may be slight fever, sweats, and chills, without any distinct localizing symptoms such as pain or tenderness in the region of the liver. In general, however, there are certain symptoms and signs which occur so frequently, and are, taken altogether, so characteristic, that suspicion at least as to the true nature of the case should be excited. Of these the most important is pain. This is usually felt in the left epigastric region, is increased by movement, by any attempt to eat, and by vomiting.

It may be sharp and lancinating, or distressing in character. It may come on suddenly, or gradually, following a preliminary stage of discomfort. Tenderness is nearly always associated with pain. It may be more pronounced at a point midway between the umbilicus and the seventh costal cartilage, although nearly always the entire hypochondriac region is sensitive. During palpation rigidity of the upper portion of the rectus muscle on the right side can usually be detected. The location of the tender point and of the rigidity is sometimes variable owing to the enlargement of the liver or of the gall-bladder, or to displacement downward of the liver. The situation of greater tenderness may be at the level of the umbilicus, or even, in rare cases, somewhat below it, under which circumstances the differential diagnosis from appendicitis becomes increasingly difficult. When the abdomen is so rigid that it is impossible to outline the liver satisfactorily, it is almost impossible to make the differential diagnosis unless the examination is made while the patient is under the influence of a general anesthetic. The rigidity may involve the whole of the right side, or may, in severe cases, be general. Vomiting is nearly always a characteristic sign. It is usually persistent, accompanied by retching, and the vomitus ordinarily contains no bile, but consists—after the stomach contents have been evacuated—of a frothy material composed of mucus and saliva, and is usually alkaline in reaction. Constipation, as a rule, is obstinate. The administration of laxatives by the mouth only serves to increase the vomiting; enemata may be returned clear, or may bring away small masses of hardened feces. Occasionally careful palpation, especially if the patient's abdomen has been relaxed by an anesthetic or by opium, will reveal the presence of a smooth, rounded, and perhaps faintly fluctuating tumor, appearing just beneath the lower border of the ribs, or in some cases lower down, depending of course upon the position of the liver. Pressure upon this may be painful or absolutely painless. Puncture of this tumor to determine whether it is actually the gall-bladder, and if so whether or not pus is present, excepting as an immediate preliminary to an operation as suggested by Minkowski, is, in Quincke's opinion—which I heartily share—so dangerous that it is wholly unjustifiable. The possibility of feeling a non-distended but inflamed gall-bladder by deep palpation with the ends of the fingers, as has been suggested by Pollatschek, may well be doubted. If localized peritonitis has occurred there may be slight edema of the skin over the hepatic region.

The general symptoms are of great importance because they serve to indicate the gravity of the disease. Fever is often ushered

in by a chill, and the chill may be repeated frequently at irregular intervals. The fever is ordinarily hectic or remittent in type, rising in the evening and falling in the morning, the fall being associated with sweating. Sometimes it is extremely irregular in character; occasionally it is persistently high, and in rare cases, usually of the most fatal nature, absent and replaced by a subnormal temperature, as in the case reported by Guyot. In some cases it is distinctly periodic, simulating malarial disease, particularly when there is obstruction of the common duct. The patient usually presents all the symptoms of extreme prostration: the pulse is rapid, feeble, and small, the expression is anxious, the mouth is dry, not infrequently there is delirium, usually of the low, muttering type, and incontinence of urine. Sometimes the spleen may be palpated in the left hypochondriac region, and usually the leucocytes are greatly increased in number, ranging between 15,000 and 30,000, and showing a preponderance of the polymorphonuclear forms. Jaundice is comparatively rare; occasionally there is a slight icteroid tint of the sclera; and not infrequently a small amount of urobilin may be detected in the urine. The method of Hay, which consists of scattering flour of sulphur upon the surface of the urine and noting whether it floats or sinks, the latter indicating the presence of urobilin, is of service in this condition; my own experience has confirmed its value. The history of the case will often throw considerable light upon its nature. If the patient has had typhoid fever, or has had one or more attacks of biliary colic, or if in addition to the other symptoms there is evidence of jaundice, the diagnosis is rendered more likely. The discovery of gall-stones either in the discharges or by the x-rays[1] may aid in the diagnosis.

In rare cases the diagnosis may be cleared up by the occurrence of certain extraordinary symptoms. In a case reported by Robson there was distention of the ascending colon with collapse of the descending colon and extreme distention of the gall-bladder, indicating some obstruction at the hepatic flexure, which was found to be due to an inflammatory process in the bile-ducts. In a case reported by Hayem gall-stones were observed in the vomit. In one reported by Ravaut there were symptoms of thrombosis in the ascending cava and in the portal vein, giving rise to extreme edema of the lower extremities and severe ascites. At the same time there was, in this case, extreme tympanites. Indeed, a thorough discussion of the diagnosis of cholecystitis would involve citing the reports of a great number of individual cases.

[1] Compare Fournier and Siegel for opposing views on this question. The prevailing opinion is decidedly against the possibility of seeing gall-stones with the x-rays.

Complications of the most serious nature may of course occur. Among these are single or multiple abscess of the liver, as in the case of Ravaut; the formation of subdiaphragmatic abscess with rupture into the right pleural cavity, and into the lung, as in the case reported by Thirolaux. Peritonitis is so common that it can scarcely be considered a complication. In a case reported by Chiari it was associated with necrotic cholecystitis.

A most serious complication, and one that is difficult to diagnose, is rupture of the gall-bladder. From the infrequency with which I have been able to find mention of this in the literature it must be of exceedingly rare occurrence. Hohenegg reports a case in which it occurred spontaneously apparently as a result of overdistention. Machard mentions a remarkable case in which an adhesive peritonitis attaching the gall-bladder to the skin caused rupture of the former. On two occasions, before rupture occurred in this case, there was acute dilatation of the gall-bladder, apparently due—as the autopsy showed—to bending of the cystic duct, the gall-bladder on both occasions appearing as a large tumor in the epigastric region. During the second attack there was severe pain, and the patient went into a state of collapse, dying the following day. At the autopsy an empyema of the gall-bladder was found, associated with purulent infiltration of the bladder wall and perforation of the posterior surface. A stone was found in the cystic duct, and although Machard considers it a secondary factor, it is not unlikely that it may have acted as a ball-valve obstructing the common duct. A remarkable case of this nature came under my own observation.

The patient, a woman of 50 years, had had for about eight years severe but somewhat variable jaundice. This was associated with occasional pain in the left hypochondriac region, constipation with clay-colored stools, hemorrhagic diathesis, and, toward the end, considerable digestive disturbance. When I first saw her the patient was profoundly anemic; the liver was not palpable, but a small elastic mass could be felt just below the border of the ribs. The condition of the patient was so bad that although operation was considered, in the absence of active symptoms it was deferred. The subsequent course of the case was as follows: the patient remained in about the same condition for several days, the tumor being distinctly palpable; then, as she described it, she had a sensation as if something had given way in the abdomen, although there was no acute pain, and the tumor disappeared completely. At the same time dulness appeared in both flanks, and there was evidence of an accumulation of fluid in the peritoneal cavity. The patient

was practically moribund, and in deference to the wishes of the family operation was not performed. She remained alive for three days without fever, but with a progressively weakening pulse, until she died.

At the autopsy, which was performed under difficulty at a boarding-house, some interesting lesions were found. The peritoneal cavity contained a considerable quantity of bile-stained fluid; all the tissues were profoundly anemic; the heart muscle was pale and soft; the liver was contracted, granular, and dark-green in color. The gall-bladder was collapsed and had in its fundus a small tear corresponding to an ulceration of the mucous membranes. Elsewhere the mucous membranes were thickened, pale, and rough; the common, cystic, and hepatic ducts were so enlarged that they readily admitted the passage of my index-finger. A probe was readily passed through the diverticulum into the duodenum. In the common duct a smooth round stone about the size of a hazelnut was found, which was freely movable. No stones were found in the peritoneal cavity or in the gall-bladder. The stone in this particular case acted undoubtedly as a ball-valve, and from time to time caused complete biliary obstruction as a result of its pressure against the orifice of the duct by the bile secreted behind it. The long course of the case had made it possible for biliary cirrhosis to occur, and finally, for some unexplained reason, probably as a result of stagnation of the bile, the gall-bladder became infected and cholecystitis ensued, followed by perforation and death. Unfortunately, at the time of the autopsy it was impossible to make cultures, and therefore it is not certain what the nature of the infection may have been.

Occasionally in cholecystitis secondary to cholelithiasis, perforation occurs into some neighboring organ through an adhesion that has been formed by a pericholecystitis. In these circumstances the only method by which a diagnosis can be made is the discovery of stones in the feces so large that it is not reasonable to suppose that they could have passed through the papilla into the duodenum; indeed, it is likely the largest stone that can so pass does not exceed a pea in size. Sometimes perforation may take place into the stomach, and then, as in the case described by Hayem, stones may be found in the vomit, or in the stomach at autopsy. I performed an autopsy on a case of this kind that had been under Dr. Musser's care in the wards of the University Hospital. The patient had had all the symptoms of pyloric carcinoma, and at the autopsy a carcinoma was actually found involving the lower portion of the stomach, which was apparently secondary to an ulceration produced by a large stone which had worked its way through the duodenum and

gall-bladder into the stomach. A fibrous stricture was found about the middle of the duodenum. A somewhat similar case has been reported by Dupré. An interesting illustration of the difficulties of diagnosis was a case that came under my observation. A man over 70 years of age had had repeated attacks of indigestion. His heart had been rather weak for years. About three months before his death he had a slight attack of jaundice, which led to strong suspicion of the presence of gall-stones, although there was no history of biliary colic. From this he recovered, but two months later had a second attack with considerable pain in the right hypochondriac region. He developed fever and finally died, apparently of exhaustion. At the autopsy the gall-bladder was found filled with numerous small stones, and the common duct was obstructed by a stone about the size of a hazelnut. The duct was dilated so that it readily permitted the entrance of the index-finger. The gall-bladder and the bile-ducts contained a considerable amount of mucopurulent material.

The symptomatology of cholecystitis, therefore, although sufficiently characteristic in typical cases, is sometimes so obscure that a certain diagnosis is impossible. It is particularly important, however, to use all precautions in making a diagnosis, especially in those cases in which the history leads to the suspicion of infection of the gall-bladder. It is altogether probable that the tenderness in the right hypochondriac region which often occurs in typhoid fever is due to infection of the gall-bladder, and all patients who have had attacks of colic and who develop fever, especially if associated with slight jaundice, should be regarded, in the absence of other adequate explanation, as examples of this condition. The importance of accurate diagnosis, in view of the fact that the only treatment is surgical, cannot be too strongly urged.

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THE LINGUAL TONSIL.

BY HENRY B. LEMERE, M.D.,

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At the base of the tongue and immediately in front of the epiglottis are the glossoepiglottic fossæ, two in number and separated by a median fold of mucous membrane. The floors of these slight depressions consist of numerous mucous glands embedded in a somewhat dense lymphatic tissue. This adenoid tissue and its contained glands is known by the name of the lingual tonsil. It is the lower segment of the adenoid ring, which further consists of the faucial tonsils on the sides and the pharyngeal tonsil or adenoids above.

In its normal condition the lingual tonsil rises but slightly above the surface, but like the adjacent tonsils and adenoids it is subject to hypertrophy. When enlarged the mass may fill the fossæ, and appears pressing upward and backward on the epiglottis in the form of a two-lobed raspberry-shaped mass separated in the median line by a raphe.

The condition is easily seen by means of the laryngoscopic mirror, and should be examined, in respect to its enlargement and the pressure exerted, both with the tongue drawn forward and also with that organ *in situ*, for in the latter position the tonsil is much more bunched up and in closer contact with the epiglottis.

The trouble resulting from this enlargement is one of adult life, for though this hypertrophy, like that of its neighboring tonsils, occurs in all probability in early life, the symptoms do not make their appearance till adolescence. It is essentially a trouble of neurasthenics and women. The mass presses on the crest of the epiglottis, sometimes causing considerable congestion and irritation, and we have a train of symptoms which are more or less distressing.

These symptoms as a rule are quite vague, and it is extremely hard for the patient to locate them. There is a weariness of the throat, a tired feeling after using the voice to any extent, sometimes the voice gives out entirely, and again we have recurring attacks of laryngitis. There may be a sense of irritation with a nervous cough, or the feeling of some foreign body in the throat, or in the patient's opinion the trouble may be much lower or higher than the site of the lingual tonsil. This feeling of indefinite pain is a pretty con-

stant symptom; recently, however, I had charge of a case in which the pain was referred directly to the tongue, the patient complaining of that member having a thick, heavy feeling. Like other symptoms of neurasthenics, and particularly the eye symptoms resulting from refractive or muscular error, these symptoms may be out of all proportion to the magnitude of the organic lesion. But though this is the case the suffering is none the less real, and the relief when obtained is none the less genuine than results from the removal of more apparent lesions in more robust persons.

This condition will very often and without any examination whatever be termed globus hystericus, and considered merely a psychic phenomenon. This term of globus hystericus is one which I am convinced is very much abused, and should only be employed when the throat symptoms are present without any organic lesion in their vicinity. When a neurasthenic comes with trouble in any other part of the body, and the correction of some slight defect removes a very distressing train of symptoms, the trouble is not designated hysteria, but because of this somewhat handy term almost any symptoms short of hoarseness, cough, dyspnea, or severe pain, if found in a woman, are branded in the physician's mind as globus hystericus, and no effort is made to find the real and obvious cause. On a par with this term is the name paresthesia of the pharynx, which is but another name for the patient's symptoms. It has been said hysteria in women goes by the name of neurasthenia in men. I am well aware that I am running counter to the alienist in claiming some organic lesion of the throat, however slight, as the starting-point of the majority of cases of globus hystericus, but how many make a careful study of the throat in these conditions? On the other hand, the laryngologist may be inclined to find the organic lesion predominating in his cases, owing to the fact that those cases he receives are the more marked ones and therefore more likely to have their origin in the larynx.

The diagnosis of the laryngoscopic mirror may sometimes be confirmed by the relief of the symptoms on cocainizing the part.

Treatment consists of course in the removal of the enlarged tonsil. This may be accomplished by means of the snare, the lingual tonsillotome, or the galvanocautery. I find the lingual tonsillotome the most useful in this operation. Chemical cauteries and astringents are of little use. The application of cocaine makes the operation entirely painless. The patient draws the tongue forward with the right hand, while the operator holds the laryngeal mirror in the left hand and the instrument is manipulated with the right. There

is but slight oozing, and all soreness leaves about the second or third day.

For the condition of varix at the base of the tongue, sometimes called laryngeal hemorrhoids, and whose symptoms so much resemble those of hypertrophy of the lingual tonsil, the galvanocautery is most efficacious.

Like the faucial tonsil, the lingual tonsil is sometimes the seat of abscess. This abscess generally points to the somewhat loose tissue at the base of the epiglottis, and the symptoms are very distressing. This is treated like quinsy, a free evacuation of pus resulting in complete relief.

The condition of mycosis also may prevail in the lingual tonsil, and is here second only in point of election to the faucial tonsil. The characteristic appearance of this leptothrix is the sharp, bristling, bluish-white points where this vegetation has taken hold. The most diffuse case of mycosis I have seen occurred in a milkman who, unlike the proverbial shoemaker's children, very liberally sampled his own wares. As the leptothrix is an almost constant habitat of milk, and water containing organic material, and as moreover it flourishes in an acid medium, my patient's milk diet was cut off, and he was put on a vigorously alkaline treatment. As the colonies extended into the nasopharynx, pharynx, fauces, larynx, and base of the tongue, I did not attempt any operative interference. Under the above treatment every vestige of the colonies disappeared. Operative procedures in addition to alkaline treatment are, however, as a rule necessary to eliminate these growths. If the tonsil is large excision is indicated. In other cases curettage followed by cauterization is very effective. A mixture of cocaine and adrenalin chloride should be applied before curetting, as the oozing of blood interferes to some extent with the action of the cautery. In all these cases I use the galvanocautery, as being handier and better limited than the chemical agents.

In conclusion I would say that in searching for the cause of a persistent and irritable cough, and of those vague symptoms in women referable to the throat, the examination is incomplete and the cause may be overlooked if the condition of the lingual tonsil is not taken into account.

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BOOK REVIEWS.

ENZYMES AND THEIR APPLICATIONS. By Dr. Jean Effront, Professor in the New University in Brussels and Director of the Fermentation Institute. English Translation, by Samuel C. Prescott, S.B., Instructor in Industrial Biology, Massachusetts Institute of Technology, Boston. Volume I. New York: John Wiley & Sons. 1902.

This work, which is a summary of the course given in the Institute of Fermentations of the new University at Brussels, is designed both for persons who give themselves up to purely scientific studies and for those who are engaged particularly in fermentation industries. So while reserving the largest place for theoretical questions, practical results have not been neglected. The work is divided into two parts. The first constitutes the present volume, dealing with the enzymes of carbohydrates and with the oxidases, as well as with their industrial applications.

In translating this work of Professor Effront, Mr. Prescott says that he was actuated by a desire to make available in English the valuable material used in the French edition, and has tried to use the author's ideas with clearness and simplicity without deviating from his own form of expression, and has made no additions or changes, so that the book is presented in a form as nearly as possible like that in which it came from the pen of the author.

Enzymes are defined as soluble ferments, zymases, or diastases. Active organic substances, secreted by cells, have the property, under certain conditions, of facilitating chemical reactions between certain bodies without entering into the composition of the definite products which result. These substances play a very important part in the phenomena of assimilation and of dissimilation of foods, and are substances absolutely indispensable to the life of organisms, for they make possible the construction of the cellular tissues, by rendering the materials assimilable and by furnishing the necessary energy.

The section upon "General Properties of Enzymes" is very interesting, entering into the details of such chemical peculiarities as are known and the methods by which they can be isolated. A pure enzyme has not yet, however, been isolated, and the substances are unknown to us except as properties attached to well known and comparatively inert compounds. The chemical composition of enzymes is uncertain and in general resembles proteid substances.

A very good section treats of the "Manner of Action of Diastases." Two theories of action are recognized. The one assumes that enzymes act chemically and that they have a definite chemical composition, the other considers the enzyme as a property and not as a substance. It is concluded that the hypothesis of enzymes as properties is much less probable than that of enzymes as substances. One always finds the capacity for action in a material substance, and one has never succeeded in separating the property from the substance. There is nothing to justify a belief that material substance plays no part in the diastatic phenomenon.

In the section upon "Individuality of Enzymes," it is pointed out that in a majority of cases cellular secretions are composed of different active substances,

and that the chemical action of each of these enzymes is limited to a certain number of bodies. These facts are sufficiently numerous for us to draw a general conclusion in favor of the individuality of enzymes, and as a matter of fact it is difficult to believe that the same active substance can in one special case act on two or three chemical substances, while in another case its action is limited to a single one of these substances. The diastases have a hydrating or oxidizing function that does not act upon all substances capable of being hydrated or oxidized. The action of acids in oxidizing is, up to a certain point, independent of the constitution of the bodies upon which they act, while diastases exert their hydrating or oxidizing action only on bodies of a strictly definite structure.

The greater part of the book is taken up with a thorough discussion of "The Enzymes of the Carbohydrates"—sucrase, amylase, maltase, trehalase, lactase, inulase, pectase, cytase, caroubinase, lipase; the ferments of the glucosides, such as emulsin, myrosin, rhamnase, erythrozyme, betulase; cymase and the oxidases.

The treatment of each of these is full and exhaustive, in each case entering into a consideration of the peculiarities of the enzyme, its general industrial and domestic applications, so that this part of the work affords profitable reading and contains important knowledge. Much that the volume contains is important to medical men, but the second volume, which will treat of the ferments acting upon proteid substances, holds out promises of greater interest to them.

MORPHINISM AND NARCOMANIA. By T. D. Crothers, M.D. Price, $2.00. Philadelphia and London: W. B. Saunders & Co. 1902.

The work of Dr. Crothers opens with an interesting historical account of morphinism, under which he includes the preparations and various uses of opium. The well known views of Dr. Crothers as to the frequency of morphine addiction are set forth in this book. Notwithstanding the criticisms of his statistics of the number of physicians addicted, he repeats the statement made in the *Medical Record*, that quite 10 per cent use morphine. The interchangeability of morphine with alcohol and other drugs is referred to. A morphinist is defined as one who uses the drug regularly for any purpose. The distinction between the crude drug eater and the morphinist is clearly stated. The writer attributes a certain tonic action to the alkaloids which are found in the crude drug. The opium eater rarely consumes such large doses as the morphinist. To the fact that the Chinese consume the crude drug, the writer attributes some of the immunity of that race to the effects of opium.

Throughout the work there is abundant reference to the effect of morphine upon the intellect, and it is surprising to one not familiar with the opium habitué to learn of the aberrent mentality shown by many of them. The chapter on the medicolegal relations of morphinism is exceedingly valuable, and for the first time places this important topic upon a secure foundation. The inference to be drawn from the writer's wide experience is that the responsibility of an opium eater is to be seriously questioned. The mere fact of opium addiction raises a presumption of mental irresponsibility.

Next to the use of morphine, cocaine seems to be the most important form of drug addiction. The lessening of the price of the drug has placed it in the hands of a large number of people. It is stated that in the larger cities of this

country only from three to eight per cent of the total amount of cocaine sold can be accounted for in legitimate ways. Chloroform is one of the less frequent forms of drug addiction, though in this as well as with the use of morphine and cocaine secret addiction is not uncommon. Throughout the book the writer gives numerous examples in which exceptional symptom-grouping was found to be due to the use of a drug. Chloroform used for its narcotic effects is said to be increasingly frequent.

Among the more exceptional forms of drug addiction are arsenic, trional, antipyrin, ginger, cologne, gelsemium, sulphonal, paraldehyde, lavender, and capsicum. To many it will be a surprise to find a chapter on coffee addiction and another upon tea, and still another upon tobacco inebriety. That all of these substances when used in excess would lead to a disturbance of the nerve centers will be believed.

This work upon the etiology, treatment, and medicolegal relations of various drug addictions is a splendid addition to the literature, coming as it does from the pen of one who has devoted many years to the study of these topics, and who is thoroughly familiar with the treatment of such cases. A perusal of the work cannot but lead to the impression that the various drug habits are increasing at an alarming rate in this country. Unquestionably the habits of the American people are altering so far as the use of alcoholic liquors is concerned. Light wines and beers are replacing the distilled liquors so commonly used fifty years ago. On the whole the consumption of alcoholic liquors as a beverage has been greatly decreased, but how far it has been replaced by various forms of drug addiction cannot be stated—unquestionably to a considerable extent.

PROGRESSIVE MEDICINE. Edited by Hobart Amory Hare, M.D., Assisted by H. R. M. Landis, M.D. Volume I, March 1, 1902.

The first article in Progressive Medicine for March, 1902, deals with the surgery of the head, neck, and chest, and is prepared by Charles H. Frazier. The writer says that so far not the slightest relief has been obtained from surgical intervention in cases of chronic hydrocephalus; the mortality of surgical intervention in this disease has approached 100 per cent. In traumatisms of the head, the tendency is to undertake more radical intervention. Cases accompanied by severe symptoms should at least have the benefit of an exploratory operation. Epilepsy is still regarded as the *bête noire* of the surgeon. In none but the Jacksonian type is there the slightest provocation for surgical measures, and in this narrow field the results are not promising. The removal of the sympathetic ganglion has fallen into deserved disuse.

The discussion of infectious diseases includes acute rheumatism, croupous pneumonia, and influenza, by Frederick A. Packard. His exhaustive and practical *résumé* includes everything that has been added to the literature on these topics that is important. In relation to insect transmission of disease, the writer says the topic is still in its initial stage, but refers to the efficiency of sulphur dioxide in the destruction of mosquitoes and other small insects. It has recently been discovered that fires on board ships are readily extinguished by the dry sulphur dioxide gas. It is expected that both ships and ports of entry will have machinery for generating this gas in large quantities for the purpose of extinguishing fires. It can be used as a disinfectant, as it destroys all vermin, including rats, by ten or twelve hours' exposure to the action of the

gas. This matter of destruction of vermin on infected ships is one that should receive increasing attention. The time lost in disinfecting cargoes and quarantining of human beings is worse than wasted when infected vermin and small animals are allowed to roam from place to place.

Floyd M. Crandall discusses the diseases of children; the space devoted to infant feeding shows that this prolific topic is still unsettled.

Ludvig Hektoen treats of general pathology, which he says has acquired such dimensions that it has long since been impossible to give a critical summary of the progress of the various departments from year to year. He has been forced to limit his review to what seemed to be the more important articles in English, German, and French. Certain subjects, such as malaria and yellow fever, are not touched upon at all, as their great and practical importance secures for them adequate presentation in other sections. He takes up especially the original investigations in serum pathology, immunity, pathogenic microörganisms, general pathology, histology, and oncology; the topics most extensively discussed are precipitants, cytotoxins, hemolysis, and agglutination.

The remainder of the book is devoted to laryngology, rhinology, and otology, by Thomas St. Clair and Robert L. Randolph.

A Practical Manual of Insanity. For the Medical Student and General Practitioner. By Drs. D. R. Brower and H. M. Bannister. Philadelphia and London: W. B. Saunders & Co. 1902.

This Manual, the preface states, is intended for students and general practitioners, wherefore elaborate case records and pathogenic details, as well as discussions of speculative and controverted questions, are omitted. This standard is therefore the one by which the book can alone equitably be tried. From this standpoint the Manual must be pronounced a success. The opening chapter deals with the question of definition of insanity. This topic is one on which much space is wasted through the almost universal error of not recognizing that definition in science can be but relative. The difficulty in defining species and genera which puzzled the older biologists has been wiped out in this way. There is no reason therefore why definitions in medicine should be dominated by the conception which has vanished from biology. Definitions of insanity are needed for medicolegal purposes only. For this reason the definition given by the authors fills all requirements. Insanity, according to Drs. Brower and Bannister, is a more or less permanent disease or derangement of the brain, producing disordered action of the mind, in such a way as to put the subject in a condition varying from his normal self and out of relation with his environment, and renders him dangerous or inconvenient to himself or others.

The chapters on etiology and pathology give as clear an idea of the topics discussed as is possible within the limits of the Manual. Like most of the better American, French, German, Italian, Russian, and Scandinavian works, the classification adopted in the Manual is based on Krafft-Ebing. The types are so well described as to furnish a ready guide to insanity as seen in general practice. Were the work somewhat more extended, the question might be raised as to the propriety of placing acute delirium under primary confusional insanity. It is true the two differ chiefly by the furibund nature of the lesions rather than by marked clinical features. Under the limitations of the preface the authors are consistent in placing the two psychoses together. The discussion of the

will and its relations to obsessions might be extended in an analytic manner with advantage.

The Manual is well illustrated and will well repay purchase and perusal. There are some annoying typographic errors which it is to be hoped the proof-reader will not overlook in the next edition. While *Verwirrheit* is correctly used under primary confusional insanity, it is also used on page 149 in place of *Verrücktheit* as a synonym for paranoia. As there has been an attempt to identify the stage of transformation of paranoia with primary confusional insanity, this error is to be regretted. Other than typographic errors of this kind the book is well issued.

THE INTERNATIONAL MEDICAL ANNUAL. A Year-book of Treatment and Practitioners' Index. Twentieth Year, 1902. Price, $3.00. New York and Chicago: E. B. Treat & Co.

This is an English work, which has achieved deserved popularity in this country. Among English physicians it has been a standard for many years. The majority of contributors, who are thirty-six in number, are English, and include such well known men as Allingham, Fenwick, Holthouse, Murrell, Saundby. Of late years a number of American writers have been added to the list, including Hammond, Boardman Reed, and Joseph McFarland. Among the more important articles in the volume are those on toxins and antitoxins, arsenical poisoning, aseptic surgery in New York, clinical examination of the blood, clinical treatment of epilepsy, disorders of metabolism, formic aldehyde in the treatment of phthisis, and lateral curvature of the spine. The work is essentially a review of the current year of the contributions to medical science which are of practical application. It contains 663 closely printed pages, is adequately indexed, and it may safely be said that there is no contribution within the year which is practically useful in the surgical or medical treatment of disease that is not mentioned in its pages. It is handsomely printed on good paper, and is beautifully illustrated. There are a large number of illustrations, many of which are colored; Plate IX, which illustrates the article on clinical examination of the blood, is especially valuable from the clear classification which it gives of the variation of the corpuscular elements in disease.

A BRIEF MANUAL OF PRESCRIPTION WRITING. By M. L. Neff, A.M., M.D. Price, 75 cents. Philadelphia: The F. A. Davis Co. 1901.

The therapeutic nihilism of the day, together with the favor with which pathology and the more exact branches of the medical sciences are studied, has led to an unmerited neglect of the prescription. This was a matter on which the fathers of medicine prided themselves, and to one who reads the literature of one hundred years ago it would appear that they thought more of having the prescription correctly written than they did of the effects which it might have upon the patient. If physicians are to write prescriptions, it is desirable that they be written correctly, as a proper method once learned is repeated indefinitely, and is thus fixed in the memory. It seems logical for those who have no knowledge of Latin to write their prescriptions in English, using, of course, the official names of drugs. If they decide to use the Latin, they will find this small volume useful. The author has not attempted a treatise on the Latin language; the rules which are given are purely empirical, and adapted to the fragmentary use of the language that is employed in writing prescriptions.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY FOR 1902. Under the Editorial Charge of George M. Gould, A.M., M.D. Volume I, General Medicine; Volume II, General Surgery. Price per volume, $3.00.

The current year-book is somewhat larger than its predecessors, the volume on General Medicine containing 700 pages, and that on Surgery 684 pages. The plan of publishing in two volumes has been favorably received by the profession. Each volume may be purchased separately, thus allowing those who are interested in general medicine or in general surgery to secure that portion of the work which they want. The current year-book sustains the reputation of the publication. Each year it has improved. There has been little change in the staff of eminent specialists who have prepared its pages from year to year; the single change during the last twelve months has been in substituting J. C. Da Costa for W. W. Keen, the latter being absent from the United States.

An extended review of this work is, of course, impossible, as it is in itself a compilation of the literature of the last year. It suffices to say that the work has been well done, the typography of the volumes is excellent, and they are adequately illustrated.

A TEXT-BOOK OF DISEASES OF WOMEN. By Charles B. Penrose, M.D., Ph.D. Fourth Edition, Revised. Octavo, 439 Pages. Price, $3.75. Philadelphia and London: W. B. Saunders & Co. 1901.

The fourth edition of this excellent work has been called for within a comparatively recent period. It is sufficient to say that this is an admirable practical text-book and useful for the general practitioner. It does not pretend to be a compendium of all that has been written upon gynecology, but it does give the main features in the diagnosis and operative treatment of women. It is concisely written, and well illustrated cuts are employed wherever they serve to elucidate the text. It thoroughly covers the field of gynecology as it has been developed in America in recent years. The author is always direct, and in many cases dogmatic. Mooted points receive but little discussion, and for the most part the author recommends a procedure or treatment that in his hands has been successful. In the last edition, several additional illustrations have been introduced, and the text has been thoroughly revised in accordance with the latest additions to the subject.

THE MEDICAL NEWS POCKET FORMULARY FOR 1902. By E. Quinn Thornton. Fourth Edition, Revised. Philadelphia and New York: Lea Brothers & Co. 1902.

The formulary of Dr. Thornton has been before the profession for some years. He has taken advantage of the frequent demand for new editions to add formulæ containing the newest drugs and to eliminate those that are no longer favorites. The volume has in this way been kept within reasonable size. It contains 287 pages, is bound in flexible covers with a flap, and is adapted to the pocket or the traveling bag.

LEADING ARTICLES.

DOUBLE MONSTERS.

What was proposed but abandoned in the case of the Siamese twins, because of supposed dangers from hepatotomy, has been successfully accomplished in the Orissa twins in Paris. This case, however, is not unique. Swingler describes two girls joined at the xiphoid cartilage and umbilicus. The band of union was one and a half inches thick; running below the middle of it was the funis common to both. The cord was first ligated. The twins were then separated by a bistoury. They made an early and a complete recovery. König describes two Swiss sisters, born in 1689, united belly to belly. They were separated by a ligature and the operation completed by an instrument. The constricting band was formed by a coalition of the xiphoid cartilages and umbilical vessels surrounded by areolar tissue and covered with skin. Beau states that two boys brought to Constantinople in A.D. 845 were united by the abdomen. One became ill and died. An attempt to remove the other resulted in death on the third day after operation. Guzenhausen had under observation twins united sternum to sternum. An operation for separation was performed without accident, but one (Gould's Anomalies), already very feeble, died three days after; the other survived. In 1881 Biaudet attempted to separate conjoined sisters six months after birth. They were semimoribund when the operation was performed. One died six hours afterward, and the other died from peritonitis the next day. Chapot-Prevost (*British Medical Journal*, Sept. 8, 1900; *Gaz. Méd. de Paris*, No. 13, 1901) after careful experimentation on dogs, finding that the liver would bear excessive cutting, separated the Maria-Rosalina xiphophagi, of Brazil, who had reached the age of eight. The operation was done under anesthesia. Maria died of pleuropericarditis on the sixth day. The liver and external wound had perfectly healed. The liver, pleuras, pericardial sacs, and mesentery of the children were continuous.

The Orissa sisters, or Radica-Doddica, who have recently been operated on in Paris, were nearly 13 years old. They were the result of the sixth pregnancy; the other five were normal. From the ensiform cartilage to the umbilicus they were united by a band four inches long and two inches wide. When facing each other they could draw their chests three or four inches apart, and the

band was so flexible they could sit on either side of the body. Separation was lately made because both had become tuberculous. The operation occupied twenty minutes under anesthesia. In severing the connection band, three arteries were cut and an ounce and a half of blood was lost. The two livers were united. Medicine given one affected the other. This was likewise the case with the Siamese twins. This went so far that Shang used to scandalize Eng by getting tipsy just as the latter was getting ready to parade in a temperance procession. As in the case of the Hindoo sisters, there was a hepatic connection through the band, and also some interlacing diaphragmatic fibers therein. There was slight vascular intercommunication of the livers, but independence of the two peritoneal cavities and intestines. The band was a coalescence of the xiphoid cartilages surrounded by areolar tissue and skin.

Some days after the operation one of the severed twins died in convulsions. These were charged to tuberculosis. While this origin is by no means improbable, since tubercle bacillus toxins cause nervous symptoms mimicking coma and epilepsy, still it would seem more probable that embolism occurred. The fact that the operation was successful except for an accidental complication indicates the necessity for operations of this type in similar cases. Although a similar operation was proposed in the Siamese twins, it was shrewdly suspected at the time that the twins welcomed the refusal because of its value for advertising. Although it was stated that a feeling of antagonism after a quarrel prompted them to seek separation, still the chief cause, according to Gould, was a desire to replenish a depleted exchequer by renewed exhibition and advertisement. At the time the operation was sought, both had atheromatous arteries. Chang, who was intemperate, had marked spinal curvature and was hemiplegic. The arteries, on necropsy, were found to be calcareous.

The marital question of double monsters presents some interesting forensic and sociologic aspects. Chang and Eng married two English sisters, twenty-six and twenty-eight years old respectively. Domestic infelicity soon compelled them to keep the wives at different houses; they alternated weeks in visiting each wife. In the case of Millie-Christine, who were united at the sacrum by an osseous union, the marriage question was raised, and, while not judicially decided, an emphatic legal opinion was given that they were two individuals. They ate separately, had distinct thoughts, and carried on distinct conversations at the same time. The legal opinion was based on the old principle that what can be separated without destroying identity must be considered as separate.

The romantic aspect of the double monster has been utilized in fiction. In a satire on "Quaterman" a double-headed queen is the heroine. It was reserved, however, for an Ohio physician to demonstrate the brilliant outlook for fiction in this particular. Dr. W. C. Cooper, of Cleves, Ohio (*Journal of the American Medical Association*, Aug. 8, 1898), has proven the great value of the double-headed monster in fiction, in his "Mystery of the Wetherton Mansion." His heroine is an atlodymus with two heads united to a single body. This monstrosity is the child of a wealthy judge of Southern Illinois. Dr. Cooper is called to attend the judge's wife in confinement, who from dystocia becomes moribund. Dr. Cooper performs Cæsarian section, delivering an atlodymus. The heads and necks are entirely distinct, the union at the necks occurring at the junction with the thorax. Tracheæ, esophagi, and blood-vessels probably became uniform and common on entering the body. It was plainly evident that each head was individual. The child was ambidextrous. One head bordered strongly on the brunette and the other on the blonde. They could nurse separately or simultaneously. When both nursed at once, the appetite was satisfied twice as quickly as when one fed. The body was that of a girl.

The village where the judge resides is cursed with the usual mendacious spinster gossip, pruriently prudish. Loitering around the keyhole of the lying-in room, she hears what she considers suspicious remarks. An attack of cholera infantum, due to an uncleaned nursing bottle, calls Dr. Cooper (during the week following the confinement) to the mansion to attend the monstrosity. On his way back to his office he is waylaid by the female "Paul Pry" aforesaid. Injudiciously, but professionally, hoping to check her inquisitiveness, he informs her that the monstrosity is dead, whereupon she has him arrested for murder. Popular rumor imputes the alleged death to natural causes.

The monstrosity, brought up in seclusion to womanhood, is carefully trained by a governess sworn to secrecy. The judge, who has not recovered from the shock due to his wife's death and the birth of the monstrosity, finds that he needs a private secretary. A young lawyer named Jack obtains the place, and in most things the judge's confidence. The secret of the monstrosity is, however, kept from him. As the judge has had continuously increasing mental depression since his wife's death, suicide is not a remarkable outcome. The resultant agitation in the household reveals for the first time the existence of the monstrosity to the private secretary.

The heads of the atlodymus have been called Alice and Anna.

Jack falls hopelessly, helplessly in love with Alice. In the innocent frankness of her unsophisticated nature, she confesses without a moment's hesitation that his passion is fully reciprocated. Alice and Anna are nearly inconsolable over their father's death. Alice, however, rallies from the shock as time drags on; she has Jack's love to lean on. Anna, being in a decline before her father's death, receives from it a tremendous downward impetus. As she has not the tonic of a lover to brace her, it becomes evident that she is sinking. She is certain that she can die without involving the death of her sister, of which Alice also feels sure. Some infallible intuition guides them to this conclusion. Since her father's death, and especially after Jack's appearance, Anna becomes positively anxious to die, since nothing in the world is left to live for. However dearly Alice might love her, life for her meant wretchedness for Alice. Unless her sister could be happy, she could not. If she should die, two would be made perfectly happy; if she should live, three would be miserable. Her intense desire to die seemingly hastens that event, which occurs about two months after her father's death.

Necessity for amputation is evident, but Alice holds the corpse two days to comply with the custom. Alice makes a quick recovery after the amputation, and her neck rapidly growing into correct relationship to her body, she becomes a faultlessly beautiful woman. Her feelings after separation from her sister Dr. Cooper (in accordance with the well-known literary canon) leaves to the imagination, for whose assistance the fact is mentioned that the amputated head is preserved in alcohol to be buried with Alice.

It must be obvious that Dr. Cooper has opened a fertile relatively unworked field of limitless possibilities in fiction. He might have instituted a rivalry between the two heads, or might, with the aid of the New York and Illinois statutes, have had a simultaneous marriage. He, however, preferred to blend the older romantic ideas with his fiction, and skilfully employed the self-sacrifice of Anna to relieve the realistic gloom of the story. Fiction possibilities in this field are shown in the case reported by a Brazilian physician, where a double-headed male pygopagus fell in love with a single-headed female syncephalus with a double pair of lower extremities and two sets of pelvic organs. It is to be hoped, however, that future delvers in this field of fiction will emulate Cooper's delicacy.

Double monsters are said to have a species of "telepathy." This belief Dumas utilized in the "Corsican Brothers." These brothers, originally a double monster, had been separated by a surgical operation soon after birth. They always suffered the same pain or dis-

ease, no matter how widely separated. This is not an uncommon belief as to twins, also. Marshall Hall (Gould's Anomalies) reports a case of twin brothers nine months of age who always became simultaneously affected with restlessness, whooping and crowing in breathing three weeks previous to simultaneous convulsions, etc. Rush describes twin brothers dwelling in entirely different places who had the same impulse at the same time, and who eventually committed suicide synchronously. Baunir has observed a similar suicidal tendency in twin brothers. The Laustand twin brothers were nurses in a Bordeaux hospital; they invariably became ill at the same time and suffered cataract of the lens together. These alleged sympathies can be readily explained through the operation of the law that, given like predisposing factors, a similar excitant has the same effect on two persons. "Telepathy" must be regarded, like "clairvoyance" as still requiring demonstration. All alleged instances, moreover, are reported by persons who, because the critical faculty is lacking, are predisposed to believe the occult. Where a natural explanation obviously presents itself, an occult is not justified. The fact should be remembered that, popular opinion to the contrary notwithstanding, twins, triplets, quadruplets, etc., and double monsters are expressions of defect, not of strength, and hence more liable to morbid influence than other children.

It is to be regretted that the Paris operation should have had an unprofessional spectacular feature. The guardian of the twins offered the operation to a leading Paris surgeon, provided he permitted the use of the cinematograph. This the surgeon refused to do, whereupon the same proposition was made to Dr. Doyen and accepted. This conduct has already been severely criticized by the Paris medical press. It is to be regretted that Dr. Doyen should have permitted the cinematograph to be used. "Moving picture" surgery should be sternly reprehended.

EPILEPSY-FEIGNING FOR FRAUDULENT PURPOSES.

Aside from the epilepsy feigned to escape the legal consequences of crime or incautious contracts or marriages, there are cases in which criminals feign epilepsy for purposes of fraud or to enable others to commit crime. A feigner of the fraud type, recently arrested in New York, habitually fell to the sidewalk in front of private residences so that he might be carried inside and cared for. He would then tell a pitiful story to excite sympathy and secure cash. He sometimes made $20 per day by this procedure. He had some

voluntary control of the pulse. Over three centuries ago "cranke" was the "character name of one who feigns epilepsy" (Notes and Queries, 1881). Harman (a cranke of 1567) was detected in what the New York police called "fake fit-throwing," near where, thirty years after, Shakespere's Globe Theater was built. In earlier days the "cranke" earned an income by being "cured" before a saint's shrine. The "advocate of the devil" (whose duty it is to detect false miracles and thus prevent improper canonization) has his ingenuity much exercised in detecting feigned diseases and feigned cures. The clinical knowledge of epilepsy displayed by Zacchias (the medicolegal counsel to the pope's court over three centuries ago) was probably in part due to his practice with the "crankes" in canonization cases.

Not only is epilepsy feigned for fraud purposes, but likewise to gather a crowd so that pockets may be picked by confederates. This feigning is known among the "fingersmith fraternity" as "dummy-chucking." The first "dummychucker" detected in the United States was James Clegg (*Boston Medical and Surgical Journal*, Jan. 6, 1881). He introduced the "art" into the United States. He joined a gang of "fingersmiths" (pickpockets) and operated in New York, Philadelphia, and Boston. Department stores afforded a rich field; ladies especially were victims during their consternation at the sight of a well dressed young man writhing on the floor. Ferry-boats when crowded offered excellent opportunities. On one occasion a kind-hearted physician coming to Clegg's assistance was meanwhile relieved of his watch. Unaware of this, the physician, on landing, called a cab and took the scamp to his office, where, after considerable effort, he succeeded in restoring the patient, about the same time discovering the loss of his watch. Clegg expressed great sorrow and denounced the outrage. The physician consoled himself by the reflection that the loss of his watch was of little consequence compared with the life he had been instrumental in saving. Clegg's conscience smote him, and he tried to get the watch for its owner, but it was "sold" before he got to the city. On another occasion he feigned a fit on a Fulton Ferry boat and was taken in an ambulance to Bellevue Hospital. After pretending to sleep for an hour, he recovered, but the authorities were suspicious and detained him for examination by the physician of the epileptic hospital. When the physician arrived, Clegg (who was on the alert), hearing the nurse say "the doctor comes," feigned a fit, and was in convulsions when the latter reached his bedside. After watching him a few moments, depressing his eyelids, trying his pulse, and observing

the numerous cicatrices on his face and forehead, the physician expressed the opinion that the case was epilepsy. Clegg, after running the gauntlet of several prison physicians as an epileptic, was finally detected at the Auburn Insane Hospital.

Harriet Jayne, a female "dummychucker," became actually epileptic at the age of 50. Epileptics have, as Preston (*Alienist and Neurologist*, 1887) pointed out, actually feigned epilepsy for a purpose. It is quite possible that a criminal with larvated epilepsy might actually feign the disease, and through the strain of feigning induce demonstrable evidence of a condition which had existed in a masked state.

Epilepsy feigned to avoid marriage Kipling graphically thus narrates:

> Did he, therefore, jilt Miss Boffkin, impulse of a baser mind?
> No, he started epileptic fits of an appalling kind.
> (Of his *modus operandi* only this much I could gather,
> "Pears' shaving sticks give you little taste and lots of lather.")
>
> Frequently, in public places, his affliction used to smite
> Sleary with distressing vigor, always in the Boffkin's sight;
> Ere a week was over, Minnie weepingly returned his ring,
> Told him his "unhappy weakness" stopped all thought of marrying.
>
> Sleary bore the information with a chastened, holy joy—
> Epileptic fits don't matter in political employ;
> Wired three short words to Carrie—took his ticket, packed his kit;
> Bade farewell to Minnie Boffkin in one last, long, lingering fit.
>
> Four weeks later Carrie Sleary read—read and laughed until she wept—
> Mrs. Boffkin's warning letter on the "wretched epilept."
> Year by year in pious patience, vengeful Mrs. Boffkin sits
> Waiting for the Sleary babies to develop Sleary's fits.

Epilepsy, as Allan McLane Hamilton points out, is a disease frequently feigned by sailors, soldiers, and convicts who wish to shirk work and gain the comforts of a hospital. Among these the soap dodge is very frequent, whence Kipling's knowledge of the subject.

EDITORIAL COMMENT.

THE SPONTANEOUS DIMINUTION IN THE SIZE OF TUMORS AND THEIR THERAPEUTIC TREATMENT.

It is characteristic of the morbid growths comprehended in the group of tumors, persistently to increase in size without any marked tendency to recover. The growth of most tumors is, however, subject to fluctuations and interruptions readily to be accounted for by their atypical structure, so that it is in most cases impossible to predict accurately what course the evolution of the tumor will take. The growth may progress rapidly, or it may be interrupted by the formation of extensive necroses with resulting cysts. The absorption of necrotic cells and the occasional absorption of the contents of cysts not infrequently lead to apparent improvement in the condition of the tumor, with reduction in size, which may be mistaken for a partial recovery. Superficial tumors not infrequently become infected by parasites gaining entrance from the skin and causing more or less wide-spread suppuration, by which the neoplasm is destroyed just as any normal tissue would be. Occasionally an extensive inflammation may cause the death of all the growing cells of a tumor, leading in such cases to actual and permanent recovery. This has frequently been observed in erysipelas, when it extends into epitheliomas and carcinomas, and has also been seen in ulcerating sarcomas.

Extremely chronic epithelial growths, such as are sometimes seen of the mammary gland, seem to interfere with their own growth through the cicatricial tissues whose contractions extinguished the nutrition and vitality of the cells.

It is unfortunate that so little interest seems to have been taken in the spontaneous improvement in neoplasms, the literature containing very few references to it, although every surgeon has had some experience upon the subject.

Whether treatment can modify the course of tumors is uncertain. It is well known that in malignant tumors treatment avails nothing, and that manipulations and operations not infrequently hasten the progress of the disease. From time to time attempts have been made to imitate artificially the processes by which nature sometimes terminates tumor growth; that most familiar to all being the Coley treatment of inoperable tumors

(sarcomas) with the mixed products of the streptococcus and the bacillus prodigiosus. Many cases are reported by Coley and others who have used his treatment, in which the injections have led to softening and subsequent absorption of the growth. The experience of the majority of surgeons has been different from that of Coley, and very few have much to say in favor of the treatment.

An interesting group of cases is described in the *Lancet* of February 1, 1902. Two cases treated by "cancroin" prepared by Professor Adamkiewicz have apparently recovered from carcinoma uteri, the details of one case being given. It seems to have led to a very remarkable cure. The other case is described by A. Laurie Watson as "a case of recurrent sarcoma with apparent spontaneous and gradual shrinking of the tumor." It is impossible to say exactly how much of the good results observed in the case of Adamkiewicz depends upon the cancroin. This product was first prepared and used in 1893, and during the nine years that have since elapsed very few references to it appear in the literature, so that we cannot but remain skeptical of the remedy, although it seems difficult to account for the improvement in the patient whose case is described, except by referring it to the cancroin. It appears from the description, however, that much of the disturbance from which the patient suffered was of an inflammatory nature, and that the improvement in her symptoms may have depended in a large measure upon cessation of the inflammation and absorption of the exudates. Concerning this fact it is very difficult to make any positive statement.

In Watson's case we have a condition presented to us that should never be lost sight of in judging the merits of any mode of treatment. The patient was a woman with a large quiescent sarcoma on the back of the neck. The tumor had existed for some time, was supposed to be a lipoma, and operation was performed solely for the purpose of giving the patient greater comfort in wearing her clothing. The manipulations of the operation led to an immediate reaction on the part of the tumor, so that an extensive recurrence of the growth took place. A second operation was attempted, but the infiltrations were so extensive that it was abandoned and the case given up as helpless. In spite of this, however, the rapid development of the tumor ceased, the absorption of nearly all of its substance occurred, and the patient's health and strength returned, and she is reported as being well, active, and suffering no inconvenience whatever from the remnant of tumor, which consists almost

entirely of skin. Had this patient received treatment by the mixed toxins of the streptococcus and bacillus prodigiosus, or the cancroin, or any other preparation intended for the treatment of the tumor, all the credit of her recovery would be given to the remedy, which as circumstances show would be entirely independent of it. It is therefore imperative that we accurately determine what processes take place spontaneously in tumors before we draw inferences regarding the advantage of any mode of treatment.

STERILIZED MILK FOR INFANT FEEDING.

A few years ago the journals were filled with the praises of sterilized milk as a diet for infants, and it seemed to be conclusively shown, on very reasonable and scientific grounds, that by sterilization alone the dangerous bacteria contained in milk could be destroyed and the food adapted to the infantile digestion. A few years, however, have made a vast difference, and at the present time one reads but little that is not condemnatory of the measure, it being commonly stated that the sterilization of the milk destroys its vitality, coagulates its proteids, lessens its nutrient value, and produces infantile scurvy; all of these objections being urged upon reasonable and statistical grounds. It has thus come about that the use of sterilized milk has been abandoned. There can be little doubt that the objections urged against sterilization and its general condemnation are undeserved, in that other conditions than the sterilization may have been responsible for the dangers for which it is blamed. It can scarcely be said that any of the "sterilized milk" prepared in the ordinary way was really sterile, the method adopted for its preparation being altogether inadequate and entirely different from that employed by the bacteriologist in the preparation of the really sterile milk to be used as culture media in his researches. The ordinary method of treatment was to place the milk, dispensed in bottles, in a steam apparatus, in which it was kept from fifteen to thirty minutes, at a temperature which gradually ascended to that of boiling water. By this means many of the bacteria contained in the milk were destroyed, and probably many of their products decomposed, and though after this treatment the milk was unquestionably better than before, many bacteria failed to meet destruction, so that no permanent improvement resulted, the remaining bacteria growing as soon as the milk again cooled. Such partially protected milk was not infrequently kept from a day to a week before it was employed

—sometimes protected, sometimes not protected, from subsequent contamination—and the results following the subsequent growth of bacteria in the milk may have been confused with the loss of nutrient properties belonging to the milk. To render milk really sterile, it is necessary to heat it to the temperature of boiling water three times on three successive days, or to expose it to live steam under pressure. However that may have been, it remains a fact that at the present time sterilized milk is out of fashion, and little attempt has been made to differentiate troubles really caused by the milk from those that may depend upon other conditions.

One of the best discussions upon the subject that has recently appeared is the paper by W. B. Ransom, in the *British Medical Journal* of February 22, 1902. In this paper the source of contamination of milk and the pathogenic properties of milk are first discussed, this being followed by a critical discussion of scurvy from boiled milk and the alleged loss of its nutrient value. The conclusions which Ransom reaches are about the same as those that should be reached by any thoughtful person. He says: "There is no solid evidence to show that milk raised to its boiling point (110° C. = 233° F.), or to the temperature of boiling water for ten minutes or a quarter of an hour, suffers any diminution of its nutrient qualities. Neither is it probable that, if consumed within twenty-four hours of the heating, it will cause infantile scurvy. The same is true of Pasteurized milk heated to 80° or 85° C. None of these methods render the milk absolutely sterile, but they do kill most pathogenic microbes (for example, those of tuberculosis, cholera, diphtheria, and typhoid), and if the milk be kept cool and drunk within twelve hours of the heating, few or no spores will have developed into bacilli. Pasteurization is probably less reliable than heating to 212° F. for ten minutes, and is also more difficult to carry out, as it is easy with simple domestic apparatus such as Aymard's or other double saucepan, or Soxhlet's or Hawksley's bottle-holding tins, to keep the milk in a bath of boiling water for ten minutes.

"In times of epidemic summer diarrhea the heating should be prolonged for at least half an hour, and the milk drunk within a few hours, or subjected again to the process, as the spores of the bacillus sporogenes enteritidis are very resistant. Under all circumstances milk, whether raw or 'sterilized,' should be drunk as fresh as possible, and then the liability to gastroenteritis and nutritional diseases will be diminished; but it is my emphatic opinion that infants who live wholly or mainly on milk, as at present supplied to us, should never be exposed to the dangers lurking in the raw fluid. Noth-

ing in this paper is intended to detract, first, from the paramount importance of children being suckled by their mothers for the first seven or eight months of their life; and secondly, from the equally vital matter of securing a pure milk supply from healthy cows, hygienic stables and dairies, and clean milk-cans. Educational and legislative measures to secure such a milk supply should have the earliest support of every medical man."

PHYSICIANS AND TORTURE.

The alleged participation of an army surgeon in torture of Filipinos by the so-called "water cure" has not unnaturally created criticism of the participation of physicians in torture, whether judicial or otherwise. Torture has never been a part of the English common law, albeit up to the nineteenth century it was of the Roman law everywhere. Torture was employed late in the nineteenth century by the Spaniards. For its employment in the case of the Spanish anarchists Canovas lost his life. The English common-law presumption of innocence throwing the burden of proof upon the State prevented torture except under military law. As political offenses came under military law, torture was employed illegally in such offenses. Torture was likewise employed in contempt of court cases by judges who gave way to that besetting sin of the bench, making law under the guise of saying what law is. Torture by judges was the great feature of the infamous Star Chamber, whose memory is perpetuated in the Constitution of the United States by the prohibition of "cruel and unusual punishment." In order that torture should not exceed the patient's strength, physicians were employed to determine how much could be borne without fatal collapse. The great physician to the Pope, Zacchias, discusses in his Manual of Medical Jurisprudence the extent to which the question (as the "water cure" was then termed) could be carried without resulting in death. Zacchias cannot be accused of undue humanity, for he gravely argues (Questiones Medico-legales) that minors are proper subjects to be put to torture. As this work of Zacchias was published in the seventeenth century, when Englishmen had already denounced judicial torture as illegal under the common law, the position of Zacchias indicates how belated the continent of Europe was in humanitarian matters compared with England. The Puritan Revolution of 1640 put a quietus on all attempts to introduce torture into English jurisprudence; the disgrace of the Roman law and the Scotch law founded upon it. The physician under the

Roman law had, like Zacchias, to determine the limits of torture. Army officers of the United States have repeatedly instituted punishments verging on torture, and for the purpose of evading the provision of the constitution prohibiting cruel and unusual punishments, have detailed physicians to watch the persons under punishment. Judging from reports from the Philippines this was the case with the surgeon accused of participating in the "water cure." This "water cure" was at one time used in all continental countries for the purpose of compelling confession. Of it Dumas gives the following rather humorous account in "The Regent's Daughter":

"Which did they give you?" asked Gaston, shuddering at the recollection of what had passed between D'Argenson and himself. "The water. They made me drink a barrel and a half; my stomach is like a bladder; I did not think I could have held so much." "And did you suffer much?" asked Gaston with interest. "Yes, but my temperament is robust; the next day I thought no more of it. It is true that since then I have drunk a good deal of wine. If you have to choose select the water—it cleans. All the mixtures doctors give us are only a means of making us swallow water. Fargon says that the best doctor he ever heard of was Doctor Sangrado; he only existed in Le Sage's brain, or he would have done miracles."

This sounds very much like the laudation that Lieutenant James of the 36th U. S. Volunteers gives the "water cure." The Filipino procedure is after starving the subject to give him uncooked rice to eat, and then force him to swallow all the water possible. Lieutenant James states that gastric distention and resultant pain is all there is to the torture. He "would rather have it than beating." The "question" (as the "water cure" was then called) is one of the "cruel and unusual punishments" contemplated by the Constitution, hence a physician goes beyond his duty, either as military officer, as medical man, or as citizen, who participates in this old torture of the Roman law.

THE PATRICK CASE AND ITS LESSON.

The attention which this case has attracted throughout the country, and the important rôle which medical expert testimony played in the trial of the case, serve to direct attention anew to the supposed anomalous position which medical expert testimony sustains in our courts of law. K. W. Millican, in the *New York Medical Journal* of April 5, 1902, says that this case demonstrates the necessity of another method of dealing with medical evidence in

criminal trials. He says that in scientific exposition two points are to be aimed at: (1) Perfect accuracy of expression without possible ambiguity; (2) intelligibility. It is stated that the medical witness, in testifying before a jury, is always sailing between these two propositions; on the one hand, if he confines himself to the technical language, he secures perfect accuracy, but at the sacrifice of intelligibility. On the other hand, if he addresses himself to the lay mind, he becomes intelligible at the expense of accuracy.

How far this difficulty is to be met by a new rule of procedure we are at a loss to comprehend. Medical testimony must be given by medical men; by this we mean the body of the profession. Attendance upon the average medical society meeting does not encourage the belief that the free use of technical language always leads to intelligibility. We do not see how the remedy advanced will greatly improve matters. It is suggested that the medical evidence should be argued by the medical witnesses before an impartial board of properly qualified medical men, the rules of evidence being relaxed so that the argument should become academic in character, and the decision of that board could be presented to the jury the same as that of a judge on a point of law. It is thought that this rule would do away with unseemliness and be in the interests of truth and strict justice. It would avoid "conspicuous conflicts of diametrically opposed personal opinion upon subjects of the first importance."

We confess that we do not agree with the suggestions made by the writer for improvement. To our mind the only practical solution of some of the difficulties attending the introduction of expert testimony relates to the manner in which experts are summoned into court. Some extension of the discretion of the court, probably with the consent of the parties to a litigation, is about the only remedy that seems practical. The invasion of the function of the jury, which is proposed in the appointing of a commission, is a reform in the wrong direction.

Now and then such a conspicuous case as the one under consideration attracts attention to some polemical defects in the introduction of expert testimony. Those who criticize the present system seem to forget that opinion testimony is given daily throughout the United States, and to a large extent it is accurate and truthful evidence, and is a valuable help in the administration of justice. Now and then a *cause célèbre* furnishes a text for presenting the diametrically opposed opinions of experts in parallel columns, and it is proposed that by some legal machinery these opinions shall be made

to fit into each other so that the medical profession may not be "discredited" by appearing to hold opposite opinions upon the same topic. The truth of the matter is that the Patrick case involves some exceedingly knotty questions upon which the profession is by no means agreed, and those facts were brought out in the court. Unquestionably it was difficult for the jury to decide between these conflicting statements. What is true of opinion evidence is often true of matters of fact. Frequently in courts of law testimony is given as to the states of facts diametrically opposed to each other. As it is impossible that both can be true, it is the business of the jury to decide which is correct. That the juries do not always decide correctly is true, but their opinions are subject to revision by the judge and the higher courts. If on a certain state of facts leading men in our profession differ, it is important that such difference should appear in the testimony, even though it be said that physicians never agree.

We have long been of the opinion that changes in the introduction of expert testimony can be made, such as permitting the trial judge to exercise some discretion in summoning experts, but such changes should come in the way of a gradual development of the practice in our courts and not through abrupt statutory alteration. There should be a gradual evolution in the practice of our courts.

OSTEITIS DEFORMANS.

A carefully written report of a case of this affection, occurring in the experience of Dr. James C. Wilson of Philadelphia, has appeared in the *Philadelphia Medical Journal* of February 15, 1902, and deserves consideration because of the rarity of the disease in this country.

Packard, Steele, and Kirkbride, in a paper published in the Transactions of the Association of American Physicians, vol. xvi, page 666, were able to collect ninety-nine cases reported as osteitis deformans. Of these they were able to sift out four as erroneous, and twenty-nine as of doubtful, diagnosis, leaving sixty-six well authenticated cases of the disease on record. Only ten of these have been reported in North America.

The disease was first described by Sir James Paget, in 1887. It is characterized, according to Packard, Steele, and Kirkbride, by the following changes: (1) Absorption of the healthy bone; (2) formation of new bone coincident but in no way connected with the absorption process; (3) the forming of calcification in this new

bone; (4) the destruction of the real structure of the bone and the addition of new uncalcified bony tissue. The result is deformity, chiefly manifested by the long bones of the body. The skull is remarkably increased in thickness, the forehead becomes large and prominent, and the face appears smaller. The clavicles are curved and thickened; the humerus is commonly less altered than the other long bones of the body, but the radius and ulna are strangely curved. The femur curves downward, and the tibia downward and forward. In consequence of the bending of the bones of the lower extremities and the spinal curvature, the height of the patient is usually diminished by several inches. The attitude of the head is striking; the chin falls upon the chest, and the head is advanced in a peculiar manner. The phosphorus of the bones is but slightly diminished, the organic matter more increased, and the inorganic matter slightly decreased. In some cases there seems to be some relation between osteitis deformans and the development of carcinoma or sarcoma. The cause of the disease is unknown; the manifestations are chiefly objective, consisting of the described deformities.

The diagnosis of the disease is said to be unattended by difficulty, but its differentiation from osteomalacia seems difficult, as both affections are characterized by softening and bending of the bones. In osteomalacia spontaneous fractures are said to be frequent, while the pathological difference between the two affections is a tendency to the irregular and eccentric formation of new bone in osteitis deformans.

Rickets, another disease associated with softening and bending of the bones, is observed in early life, while osteitis is a disease of adults, the case reported by Wilson being a man 63 years of age. Differentiation from other diseases of the bones seems to present no difficulty. Treatment is of no avail.

THE HOUSE-FLY AS A DISSEMINATOR OF DISEASE.

Heretofore the house-fly has been regarded as a quite harmless though somewhat annoying insect. The importance of the mosquito in disseminating malaria and yellow fever serves anew to call attention to the importance of insects in the spread of disease. The house-fly has been investigated, and it is thought that his rôle in this respect is largely mechanical. That it is important in disseminating typhoid fever and possibly tuberculosis is shown by the fact that his legs easily become infected, and thus might convey the

germs directly to food. That the house-fly might possibly act as a host for some parasite has not been demonstrated, but it is strongly suggested by D'Arcy Power (*Lancet*, April 5, 1902) in a discussion before the Chelsea Clinical Society on cancer. He said that the microscopic investigation of malignant growths has not solved the etiology of cancer. It would be well to ascertain whether there is an intermediate host to convey the cancer germ. There are some things in the distribution of cancer that lend weight to this view. In reference to this matter, he has been studying the London house-fly in autumn. The ordinary house-fly cannot inoculate directly, for its mouth-parts are only capable of sipping; yet it is a common experience that flies do bite, and that they bite more in the late summer than in the spring, and that the fly which bites looks like a house-fly. The bite is a true one, for it raises a small papule, though in healthy persons it usually causes no reaction. During the last year Mr. Power has treated three patients for carbuncle, who attributed their condition to the bite of a house-fly. There are two kinds of house-fly: one the ordinary sort, and the other the Stomoxys, the latter being armed with two complete sets of lancets. The house-fly is a little larger and holds its head outward when it rests. The Stomoxys has three interrupted whitish stripes on its back, and its head is held erect.

This observation of Power is certainly very interesting, and opens up possibilities in the study of dissemination of disease by the house-fly which have not heretofore been appreciated.

THE METHOD OF OPENING THE ABDOMEN.

The practice of opening the abdomen in the middle line in exploratory operations, or for the relief of some intra-abdominal conditions, still obtains to an extent that is hardly justified by the results. It is a fact that the weakest portion of the abdominal wall is in the middle line, and just why this should be chosen as the site of an abdominal incision it is difficult to state. There is, of course, rather less hemorrhage, because the blood-supply is very much diminished in this area, but with modern methods of hemostasis this complication is readily dealt with. The McBurney intramuscular method of opening the abdomen in appendectomy has been generally followed, though substantially the same method may be employed in most abdominal operations, providing the incision is made over the rectus muscle, opening the sheath of the muscle, drawing its fibers to one side, and then going into the abdomen through the

posterior sheath of the rectus. This admits of a valve-like incision in which unsevered muscular fibers with an intact nerve supply are brought directly in front of the incision of the peritoneum, making a hernia almost impossible. A number of operators have used and recommended this incision in cases in which the abdomen is entered, for whatever cause. It is certainly a suggestion which seems to have merit, and we know of no aseptic case in which this method of entering the abdomen was employed which was followed by hernia. The possibility of more or less giving way of the abdominal wall, where the incision is made in the middle line, is always imminent.

V. C. Pedersen, in the *Medical News* of March 1, 1902, describes a similar method of entering the abdomen for the purpose of making a ventrofixation. The procedure consists of an incision two or three inches long with a retraction of the skin either to the inner or outer side. The sheath of the rectus muscle is then opened about three-quarters of an inch from the median line, the muscle being loosened from its sheath and retracted as far outward as possible. The peritoneal cavity is then entered.

ORGANIZATION OF THE PROFESSION.

The recent discussion before the Physicians' Club of Chicago shows that the question of professional organization is occupying the thought of a large number of medical men. It is clear that the profession has arrived at the parting of the ways. On the one hand lie the organizations of the past, on the other a militant, active organization of the profession, or, if you please, a trades-union. The present organization of the profession has reached its limit on the old lines, which were social and scientific. The question now presents itself, how far are the old organizations effective in meeting modern requirements? In England and Germany stronger organizations have been formed, because of the serious inroads of clubs and insurance organizations into the incomes of the profession. Scarcely one-fifth of the regular medical profession of the United States is at present in medical organizations. When asked to enter, they frankly inquire what the present organization can do for them; without an object they will not join. It is evident that they only need something to organize for to bring them into the ranks.

The question of organizing the profession upon an economic and political basis is one which will be discussed largely at the next meeting of the American Medical Association. The attitude of the

larger medical body upon this subject will do much to settle the question. Organization will come from above, rather than from below. We are satisfied that if the wishes of the great majority of the profession are to be met, a more effective organization will be necessary, and one which will be of greater value in serving the material interests of the profession.

A NEW DISEASE OF THE BEARD.

The invasion of the tropics has resulted in adding several new diseases to those heretofore recognized. One of the latest is a new parasite of the hair, recently described by M. P. Vuilaemin, before the French Academy of Sciences, February 3, 1902. It is said to be analogous to a parasite known as Piedra prevalent in Columbia. The new parasite is named *Trichosporum Beigelii.* The parasite was found in a young man returned from Tonkin. Some time before he left the East he noticed that the hairs of his mustache and some portions of the beard were split, and that they fell upon the slightest contact. Both the beard and mustache were shaved, but later, when the mustache was allowed to grow, it became reinfected with the parasite. It is believed that the latter was conserved in the hair of the nostrils. In addition to the splitting and the brittleness, certain nodes are produced on the hair shafts, and these are the sites of the parasites. The latter have been cultivated upon carrots and mushrooms, the character of the growth having been found to be identical with that of a case studied a year ago.

ABSTRACTS.

MEDICINE.

Spontaneous Rupture of the Heart.—GROUT. *American Medicine*, vol. iii, No: 15, p. 606, April 12, 1902.

Three cases are reported; one was in a man 65 years of age who was convalescent from facial erysipelas. During the night he arose from the bed, walked about for a time, and then sat down on a stool and rested his head on the bed. Later he was found in the same position dead. The autopsy five hours after death showed the pericardium filled with partially coagulated blood; the heart weighed fifteen ounces, was fatty, and the coronary arteries were atheromatous. A rupture nearly an inch in length was found in the anterior portion of the left ventricle.

A second case was that of a man of 68 with no history of cardiac trouble. During a warm day he exerted himself, and this was followed by an attack of diarrhea which lasted for a few days. After that he noted that his pulse was more rapid than usual. Ten days after the extreme physical exercise mentioned, while on his way home, he became excited, and was taken with pain in the region of the heart. Two days later the writer saw him, and there were no symptoms excepting a pulse of 125 and pain in the region of the heart. There was no dyspnea, and auscultation revealed nothing but a feeble, rapid action of the heart. For the next three days there was some improvement, the cardiac pulsations becoming more regular and steady and the heart's action steady. For two days he was up and about the house, and while sitting at the supper table there was a tonic spasm in which he lost consciousness. Following this the surface was cold, and he was somewhat rambling in talk, there was no pulse at the wrist, and the heart sounds were very feeble. On the following day there was improvement in the symptoms. On the evening of that day death occurred suddenly. Thirty-six hours after death an autopsy was made, which revealed one and a half pints of partially coagulated blood in the pericardium, and all the other organs normal. The heart weighed fifteen and a half ounces, and the conditions were substantially the same as in the first case: a rupture one inch in length was found in the anterior wall of the left ventricle near the apex.

A third case was that of a man 69 years of age, a merchant of

good habits. A week before his death he consulted a physician for a pain in the stomach, at which time a rapid pulse was noted. For the following week he was indisposed, but was at his place of business every day. He had been a regular attendant at church, but on Sunday concluded to remain at home while all the other members of the family attended church. On their return he was found dead. In this case the autopsy revealed practically the same condition as in the other two cases. The rupture was the same in size, and the heart muscles and coronary arteries were substantially the same.

Of the one hundred cases collected by Quain, sixty-three were in individuals over 60 years of age, though every decade was represented. Fatty degeneration was the predisposing cause in the majority. The exciting causes were physical exertion or mental excitement, and a number of ruptures occurred when the individuals were at rest. In forty-three of seventy-six cases, the rupture was in the anterior wall of the left ventricle. The right ventricle was ruptured in thirteen cases, the right auricle in seven, and the left in two. In seventy-one death was sudden, occurring within one or two minutes. The remaining patients lived from a period of twelve hours to eight days.

Dengue Spread by Mosquitoes.—GRAHAM, H. *Medical Record*, vol. lxvi, No. 6, p. 204, Feb. 8, 1902.

There is evidence to show that dengue does not spread to any extent when carried away from certain regions which are its favorite abode. Along the lowlying coasts of the East and West Indies it is endemic, but in spite of the most active intercommunication, it is never carried into the highlands. Early in July of the year 1901, the city of Beyrout in Syria was visited by an epidemic of dengue. It increased in severity until few houses in the city escaped.

In the beginning of the epidemic the writer began some experiments to learn if the Culex, which exists in great numbers in the city and environs, was responsible for the spread of the disease. The first experiment was made with a mother and her nursing child. The day the mother was taken with the initial chill all the mosquitoes in that part of the house were killed by generating chlorine gas, and the windows carefully screened. The child, eight months old, was allowed to nurse as usual; it did not contract the fever. Another experiment was carried out upon four children who occupied the same apartment. The room was carefully freed from mosquitoes the day the youngest child was taken sick with the disease. The children all slept under the same cover and played together during

the day, and none of the other children contracted the disease. A third experiment consisted in freeing from mosquitoes the room occupied by a father who had the disease. Notwithstanding the intimate association with his wife and children, none of them contracted the disease.

In four cases, healthy young men who were exposed to the bites of mosquitoes which were taken from beneath the mosquito net of patients affected with dengue, three of them contracted the disease; the fourth did not, but it was stated that he had had an attack of the disease two years before.

These experiments, seeming to show that the Culex might carry the disease direct from one patient to another, were not deemed conclusive, because the observations were made in a city in which an epidemic of the disease was rife. Accordingly, some mosquitoes were taken to a mountain village in which no case of dengue had ever been observed. The mosquitoes were liberated in a net in which healthy individuals slept. In a few days they came down with the disease.

Examination of the blood of patients presenting the disease showed certain ameboid forms in the red blood-corpuscles. In over one hundred cases in which the blood was carefully examined, these structures were noted. It resembles the plasmodium of malaria, but its cycle of reproduction is much longer. By keeping accurate records of cases and examining the blood, it was possible to obtain serial slides. The writer figures a number of forms of the hematozoön, which, from its constant presence, he regards as the probable cause of dengue. It has a close resemblance to the parasite of Texas cattle fever.

Repeated Tappings in Tuberculosis of the Pericardium.—Sabin, F. R. *American Medicine*, vol. iii, No. 10, p. 388, March 8, 1902.

A case is reported of a colored man 20 years of age, who complained of severe pain over the heart. The illness began two months before admission to the hospital with pain in the right chest aggravated by deep breathing. There was cough and shortness of breath and an account of night-sweats. Three weeks before admission he began to have pain over the heart, so severe that he gave up work.

On admission to the hospital the lungs were nearly normal, except over the lower portion of the right chest, where the percussion note was impaired and the breath sounds feeble. Over the heart was heard a large to-and-fro precordial rub. It was superficial, rough, and altered by pressure. The heart sounds as heard

were clear, but a point of maximum impulse was clearly perceived. The cardiac dulness was normal in extent. Slowly the signs of precordial effusion developed, and with it was an increased pulse-rate. The temperature went up, ranging between 100° and 102°. As the fluid in the precordial sac increased the heart sounds and the friction rub became less distinct. Cough developed, which came in paroxysms and was high-pitched. There was increased difficulty in breathing. About twenty-five days after admission, three signs showing that the precordial effusion was considerable in amount developed. The apex beat was no longer visible, there was distinct bulging of the precordium, and signs of compression of the left lung. The pericardium was aspirated, the needle being introduced in the fifth interspace, 1.5 centimeters outside the mammary line. After the aspiration the patient improved. The third pericardial tapping was needed to remove the reaccumulating fluid, after which there was a steady improvement. Examination of the fluid showed the presence of the tubercle bacillus. Later there was an effusion in the right pleural cavity, which in all was tapped fourteen times. The outcome of the case shows the value of repeated tappings in serous effusions, even when they are tubercular. A peculiarity was that in the exudate a differential count of the leucocytes showed a very high percentage of small and a few large mononuclear forms. Only two per cent were polynuclear, this ratio remaining constant.

Typhoid Bacilli in the Sputum of Typhoid Patients.—JEHLE, L. *Wiener Klinische Wochenschrift*, 15th year, p. 232, Feb. 29, 1902.

Typhoid bacilli have been found in lung exudates post mortem by a number of observers. As a rule the examination of the sputum of typhoid patients has given negative results. In the Kaiser Franz Joseph Hospital during the past two years, the sputum of typhoid patients has been systematically studied in reference to the presence of typhoid bacilli. In all twenty-three cases were examined, which included thirty sputa and fifteen cases in which the bronchial tract was examined after death.

The results of the studies show that the typhoid bacillus is present in the sputum as well as in the bronchial secretion of most cases in which pneumonia complicates typhoid. As a rule the sputum in these cases has a distinctly hemorrhagic character. In some cases the typhoid bacillus was obtained in pure culture, and in others associated with other microörganisms, especially the influenza bacillus. In some cases the writer found the typhoid bacillus in sputum in which there were no clinical or anatomical evidences of involvement of the lungs.

A Case of Thyreoptosis.—IGLAUER, S. *Cincinnati Lancet-Clinic*, vol. xlviii, No. 16, p. 407, April 19, 1902.

The writer exhibited to the Academy of Medicine of Cincinnati a case which had applied for treatment for an acute bronchitis and slight laryngitis. After remaining under treatment for about two weeks there was a complaint of swelling of the neck, and on examination it was discovered that when the patient coughed there was a distinct tumor formed in the lower part of the neck. When in

a state of repose the tumor was not visible. The patient also complained of stiffness and pain in the muscles of the left side of the neck, and a dulness on percussion under the sternoclavicular joints.

Aside from a slight narrowing of the pupil on the left side the tumor caused no disturbance, and since the enlargement was first noticed it has decreased in size.

Somnolence from Ear Lesion.—HARLAND, W. G. B. *Philadelphia Medical Journal*, vol. ix, No. 13, p. 584, March 29, 1902.

The case of a boy 13 years of age is reported, in whom abnormal somnolence developed. He would go to sleep whenever his attention was not aroused. On one occasion he slept on a lounge for twenty-four hours. The condition did not in any way simulate petit mal. These symptoms had existed a month. Aside from the abnormal somnolence, there was no other symptom—no vertigo, no tinnitus, no nausea or headache. A small mass of impacted cerumen was found in the left ear. This readily came away upon syringing the ear, and a few drops of fetid pus was found behind it. The drum was macerated and had a large perforation in the lower posterior quadrant. Within a day, without other treatment, the morbid somnolence disappeared.

SURGERY.

The Radical Cure of Hydrocele by Carbolic Injections.—COLEY, W. B., and SATTERWHITE, P. A. *New York Medical Journal*, vol. lxxv, No. 13, p. 537, March 29, 1902.

The writers report a number of cases of radical cure by the injection of two minims of carbolic acid. They explain the failure of many to secure a radical cure by this method by the fact that too dilute solutions were employed. The so-called 95-per-cent carbolic acid, as found in the shops, is usually much below this strength, and is much too weak to give efficient results in the injection method in hydrocele. An important procedure in the technique of the operation is to completely empty the sac. For this purpose the writers employ a double cannula, the inner one projecting slightly beyond the outer, which may be attached to an ordinary hypodermic syringe when the injection is to be made. The cannula is first introduced and the hydrocele fluid withdrawn, compressing and manipulating the sac so as to empty the sac completely. The hypodermic syringe is then screwed on to the cannula and from two to three drops of pure acid injected. The treatment of a number of patients by the ordinary commercial carbolic acid, supposed to be pure, did not compare in results with Schering's carbolic acid crystals, to which just sufficient glycerin had been added to liquefy.

The reaction obtained from two minims of this solution was greater than that obtained from eight to ten of ordinary carbolic acid.

After a careful review of the method at present employed, the authors are convinced that the carbolic acid injection method of Lewis is the best. It is easily performed and almost uniformly successful, the only disadvantage being the doubt as to its always being free from risk. While this risk may not be great, there is certainly some danger in introducing considerable amounts of carbolic acid into the sac. Just as good results may be obtained from an injection of two or three minims, and this is devoid of risk. If a cure of large and long-standing hydroceles may be obtained by this procedure, it is not justifiable to perform an operation that will confine the patient to his room or the hospital for a period of ten days. They recognize that there is a difference in hydroceles, and it would be absurd to expect a cure from the injection method in cases where the tunic is calcified or greatly thickened. The cases which they have treated have not been selected, but have varied from the recent hydrocele in a boy of 14 to a hydrocele of over forty years' duration in a man of 62, and the results have been uniformly good.

Trendelenburg's Operation for Varicose Veins.—GOULD, A. P. *Lancet*, vol. clxii, No. 9 of vol. i, p. 576, March 1, 1902.

The Lettsomian lectures for the current year upon diseases of the blood-vessels were delivered before the Medical Society of London. We have excerpted that portion dealing with the Trendelenburg operation, as Gould seems to have had an extensive experience with the method, of the value of which there is considerable difference of opinion.

During the past six years he has treated almost every varix of the lower extremities that required operation by this method. Up to the end of 1901 he had operated upon 120 cases. One great advantage of the operation is that it is simple, rarely requiring more than five minutes for its performance. Gas and oxygen are often the only anesthetic needed. The vein is best exposed by an oblique incision from one and a half to two inches long parallel with the groin and having its center over the vein. The vessel is cleared and a double ligature placed on it, one being tied as high up as possible and the other about two inches lower down. The intervening portion of the vein is then cut out. The wound is closed by a few sutures and covered with a collodion dressing; as a rule the patient is able to be up and about on the eighth day. In only two of the cases did no benefit result from the operation. With the exception of these, all stated that there was less pain, though in a few they

spoke of some discomfort after prolonged exercise. The result of the operation in relieving discomfort is remarkably good. In no case was there an increase in the varix. The value of the procedure in retarding the development of the disease is shown by the fact that many of the operations were in young people, in whom some progress in the affection might have been expected. In many cases the varices shrank, but did not disappear; in some they were flaccid and pendulous. The tendency to thrombosis is markedly lessened.

In conclusion the writer says that the Trendelenburg operation is not only simple and safe, but is useful in nearly all cases of varix. It may be relied upon to relieve the pain and stay the progress of the disease, often leading to a shrinking and disappearance of the varices that have already formed. Its best effects are seen in those cases where there is regurgitation into the superficial veins. Its superiority to excision of varices is greatest in cases of widely distributed varicose veins, and it lends itself to many cases in which excision of the varix is impossible.

Ligation of the Tear-duct in Acute Suppuration of the Cornea.—BULLER, F. *Montreal Medical Journal*, vol. xxxvi, No. 3, March, 1902.

The writer was led by the fact that a large proportion of the cases of suppurating keratitis are due to infections which have their origin in the tear-duct to attempt to eliminate the latter in the treatment of this disease. A dacryocystitis is a contraindication to any operation involving an incision into the eyeball. A patient operated on for cataract, in whom the puncta lacrimalia was unhealthy, lost the eye. In operating upon the opposite eye, in which the tear-ducts appeared to be unhealthy, No. 2 iron-dyed silk was passed around each duct and tightened sufficiently to occlude the canals, but without cutting through them. The second cataract operation was satisfactory, the wound healing without suppuration.

Encouraged by this success, the writer determined to apply the method in the first case of suppurating cornea that came under his observation. A patient soon presented whose right cornea was extensively ulcerated; only the upper and inner quadrant of the cornea was sufficiently clear to afford a view of the iris. Pressure over the tear-ducts caused a regurgitation of mucus and pus from the sac. Loss of the eye seemed almost certain, and the most heroic measures were indicated. The tear-ducts were thoroughly cleansed with bichloride solution and the canaliculi ligated. The conjunctival sacs were disinfected, cocainized, and the diseased cornea touched with a solution of formalin one in sixty. The

conjunctival sac was then filled with airol ointment and a compress applied. The local treatment consisted in hot boric acid fomentations and the free use of airol ointment. The formalin caused some reaction for a couple of days, and then there was steady improvement. The results were fairly good. There was an adherent leucoma, but more than half of the cornea was sufficiently clear to show the iris behind a shallow anterior chamber, and there is a prospect of ultimately obtaining useful vision. The effect of the treatment was a complete arrest of the corneal suppuration, and a portion of the cornea that had been completely opaque regained transparency. There is no difficulty in opening the canaliculi when they have been ligated for two weeks, nor does their temporary closure lead to disturbance from increased accumulation in the tear sac.

A Plastic Operation for the Restoration of the Sphincter Ani. — CHETWOOD, C. H. *Medical Record*, vol. lxi, No. 14, p. 529, April 5, 1902.

The patient had suffered a severe laceration in the anal region, and had been operated on eight or ten times in an effort to restore the continuity of the sphincter muscle. At the time he came under observation there was inability to retain the feces, and he constantly wore a mechanical plug. Upon examination, there was little evidence of the existence of an external sphincter muscle.

The patient was placed in the knee-chest position and a semicircular incision was made, with the convexity toward the coccyx. The knife was entered in front of the anus on a line external with the tuberosity of the ischium, and brought out at a similar point on the opposite side. The flap thus made was turned down so as to expose the lower end of the rectum and the edges of the gluteal muscles. A ribbon-shaped piece of muscular tissue about one-quarter of an inch in breadth and one-sixteenth of an inch in thickness was now separated from the gluteal muscles, these strips remaining attached above. The separated muscles were then transposed so that the fibers decussated; the right-hand muscle was crossed over to the left, and the left to the right hand, underneath the ligamentous connection between the anus and coccyx. These two muscular strips were made to encircle the gut and to meet anteriorly. There existed a very small remnant of sphincter muscle on each side of the rectum, and to these the muscular strips were attached.

The finger in the rectum now recognized the constriction formed by this purse-string arrangement, and the flap dissected away was sutured again in place. The operation proved to be a success, as the patient upon leaving the hospital a few weeks later was able to

retain the feces unless the accumulation was liquid, when some leakage occurred; but later the newly made sphincter exercised sufficient control to retain the bowel contents under all conditions.

Treatment of the Deformity in Pott's Disease.—FINCK, J. *St. Petersburger Medicinische Wochenschrift*, 27th year, No. 12, p. 107, March 23 (April 5), 1902.

The writer discusses the manner in which the deformity is caused in Pott's disease, and comes to the conclusion that the weight above the diseased vertebræ is the most important element in its production. The reflex contraction of muscles is an effort on the part of the patient to relieve the painful spine from weight. The most important indication in the treatment is to relieve the spine from this pressure, and the most valuable means is the maintaining of the horizontal position, which is superior to any brace or corset that can be devised. If this is carried out for a sufficient length of time, it will be found that the deformity gradually becomes less until the spine is finally straight, providing that there has not been a bony ankylosis in the faulty position. After the spine has been fully extended by maintaining the horizontal position, care must be taken not for a moment to raise the patient in the slightest degree. Once during the twenty-four hours he may be turned upon the face, in this way obtaining some relief from the restraint which the constant position upon the back entails. Manual extension by the head and heels, gently applied, aids in the reduction of the deformity, and when this has been accomplished a plaster-of-Paris jacket is applied, with the patient in the horizontal position.

Sterilization of Rubber Catheters.—COTTON, F. J. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 13, p. 330, March 27, 1902.

It has been experimentally shown that various rubber catheters, bougies, and filiforms of different grades may be subjected to a boiling temperature for prolonged periods, and frequently, without destroying their texture, provided concentrated salt solution is employed—ammoniac sulphate $(NH_4)2SO_4$. This salt may be obtained from wholesale chemical dealers. It is a by-product, and often dirty, so that it must be dissolved and decanted. It is soluble in one and three-tenths parts of water. A saturated solution boils in an open dish at 227° F. An ordinary open pan is used, over a rose burner.

The result of numerous experiments made over a considerable period leads to the opinion that catheters and bougies may be boiled repeatedly for long periods in saturated solution of ammoniac sul-

phate, or chloride of sodium, without damage. The ammoniac sulphate is the best salt to use, as it is easier to handle and spatters less when it boils down. Boiling in plain water almost instantly destroys the coat of catheters, as does steam. Formalin sterilization does no great damage, but is unreliable.

A Clinical Research into Cocaine and Eucaine.—CRILE, GEORGE. *Journal of the American Medical Association*, vol. xxxviii, No. 8, p. 491, Feb. 22, 1902.

The writer has made a large number of experiments upon animals, which is summarized in this short article. The details of the experimental work will be published elsewhere. These local anesthetics when applied to nerve trunks produce a blocking of the afferent impulses. In this they have a distinct advantage over general anesthesia, which merely prevents the appreciation of pain. General anesthesia does not prevent these afferent impulses acting upon the vasomotor, respiratory, and cardiac centers, thus contributing to shock. By the use of local anesthetics shock can be to a great degree avoided.

Menthol Inhalation Preceding the Administration of Ether.—BRIGGS, W. A. *American Medicine*, vol. iii, No. 17, p. 680, April 26, 1902.

The claims put forward for a preliminary mentholization of the air-passages before the administration of ether are sufficient to make it worthy of trial. The writer places a drachm of oil of peppermint, or the same quantity of a saturated alcoholic solution of menthol, in a cone, and the patient is allowed to inhale it for three minutes before the ether is begun. The advantages claimed for it are an entire freedom from cough and suffocation, and a comparative freedom from nausea and vomiting. The anesthesia is rapid, and there is an absence or a marked shortening of the period of excitement.

Operation for Rhinophyma.—RUSCH, PAUL. *Wiener Klinische Wochenschrift*, 15th year, No. 13, March 27, 1902.

The writer figures an extreme case of this deformity, which is so marked in some cases and such an unpleasantly prominent disfigurement. The operation chosen was a complete excision of the hypertrophied parts. An excision was made under local anesthesia, it being in effect a decortication, sufficient skin being left to furnish covering for the underlying tissues. The excision was extended upon the cheeks, where the thickened and altered skin presented the same conditions as that covering the nose. There was consider-

able hemorrhage, which was controlled by pressure with iodoform gauze. The first dressing was made five days after the first operation. On the thirteenth day the incised portions of the skin were nearly covered with epithelium.

Three methods for the relief of this condition are discussed: the wedge-shaped incision, which is only useful in certain cases where the disease is circumscribed; the partial excision, which is not to be recommended, as it is frequently followed by relapse; and thirdly, a decortication, which leaves a layer of normal skin. The latter method is the best.

THERAPEUTICS.

Treatment of Cholelithiasis.—THOMSON, W. H. *New York Medical Journal*, vol. lxxv, No. 16, p. 661, April 19, 1902.

No comparison is possible between stone in the urinary bladder and cholelithiasis. The former always calls for surgical intervention, but the latter only in exceptional cases. In this matter hospital experience is misleading, as cases admitted to hospital are of greater severity than those that are treated outside. In thirty-one cases in which the subsequent history was obtained, there were single attacks in only four; the others were all multiple, at varying intervals from a few months to several years. Of these thirty-one cases, only one was recommended for operation, and in this case there was suppuration of the gall-bladder, and seventy calculi were removed at the operation.

The difference between urinary and biliary calculi is that the latter is not a "stone" in the sense that the former is. In the majority of cases gall-stones float in water and resemble more closely hardened cheese than they do stone. They are soluble in a variety of media. The least common disposition of a stone is to have it discharged into the intestine. If the bile passages have been distended by the passage of a stone, they seem to remain dilated, and other stones, if present, will be readily passed. Obstruction is often relieved by having the gall-stone float back into the gall-bladder. In the majority of cases, under the action of bile, the calculus is broken down into a detritus which is not recognizable in the feces. That this process is much more common than is generally supposed is certain, and hence the chief indication in the treatment of gall-stones is to increase as much as possible the flow of normal bile. It is only when concentrated bile becomes loaded with the products of a local mucous catarrh caused by infection that such concretions can

form. Nothing is better calculated to resist this process than an influx of pure bile, which is itself a watery liquid with marked solvent properties. Hence, medicinal treatment is useful, except in cases of hard, impacted calculi in the common duct, which nothing but an operation can remove.

The first indication in the treatment of cholelithiasis is to improve the intestinal conditions and relieve the chronic constipation, which favors the infection of the bile passages. The efficiency of Carlsbad waters in the treatment of this condition is due to the relief which they afford to the coincident intestinal catarrh. A serviceable procedure is to prescribe alternating doses of two drachms of sodium sulphate, or sodium phosphate, or Carlsbad salts, to be dissolved in a tumbler of hot water, with ten grains of sodium salicylate, every morning on rising. By changing the saline every few mornings the laxative effect of the solution is prolonged. A weekly or biweekly mercurial laxative, taken at night, is also of great service.

Sodium salicylate and benzoate are true cholagogues, and they may be taken either in capsules or dissolved in Vichy water. Large doses of the salicylates are not necessary. The most efficient agent in the treatment of gall-stones is olive oil, when properly administered. It is not necessary to give the massive doses which have been recommended, but one or two ounces is sufficient to stimulate the secretions of the intestinal tract and cause a free flow of watery bile. The oil is best taken in a cup of hot milk at night. The writer's success with this method cannot be accounted for on the doctrine of chances. The relief obtained in the procedure is not immediate, but there is a progressive amelioration of symptoms, with paroxysmal attacks, becoming lighter and fewer, until they cease.

The Medical Treatment of Cholelithiasis.—McGee, J. B. *Cleveland Medical Journal*, vol. i, No. 2, p. 102, February, 1902.

The immediate indication in an acute attack of cholelithiasis is the relief of pain. The local application of heat, or mild counter-irritation, combined with the sipping of hot water or cracked ice to allay the vomiting, are useful adjuvants to morphine for the relief of the pain. The value of medical treatment in averting a recurrence is not generally accepted, but it is probable that the judicious use of suitable remedies hinders the production of the calculi. Most surgeons are agreed that when stone is present it is necessary to remove it surgically. But there are some excellent surgeons who believe that the operative treatment of cholelithiasis is wholly unnec-

essary. The truth probably lies midway between these extremes, certain cases responding to medical treatment.

The diet should be regulated, avoiding fatty and rich foods, and alcoholic liquors should be rigidly excluded. Constipation, if present, should be corrected. Ox-gall is one of the most efficient remedies in acting upon the liver, as is the free use of water, especially if of alkaline reaction. The reputation of Carlsbad and other mineral springs is probably due to the water, which dilutes the secretions and aids in elimination. It is a fact that most subjects of cholelithiasis take water in small quantities, and this favors concentration of the bile and indirectly tends to the formation of gall-stones. A satisfactory substitute for Carlsbad and Vichy waters is a solution of bicarbonate of soda. The sodium salts are very useful in aiding hepatic functions. Under their use the mass of bile secreted is increased, and its consistency is lessened. They appear to favorably influence the catarrhal condition of the bile passages, so generally present in those predisposed. The phosphate, benzoate, or salicylate are the forms generally preferred, the last salt being of especial use in liquefying the bile.

After surgical operations the calculi may recur, the proportion of recurrence being variously stated by different writers. Most surgeons recommend a course of Carlsbad water after the operation; and if jaundice persists, pilocarpine may be given twice a day for a week or two.

Finsen's Method in the Treatment of Oriental Boil. — PETERSEN, O. V. *St. Petersburger Medicinische Wochenschrift*, 27th year, No. 6, p. 49, Feb. 22, 1902.

Among the recent importations of tropical disease is the disorder known as Pendjeh ulcer, sometimes called Aleppo boil and other names, according to the place in which it is found. The French writers call it tropical ulcer. The term Oriental boil is the most satisfactory of any term heretofore employed. The disease commonly begins upon parts of the body which are not covered with clothing. There is at first a slight uneven elevation of the skin, which is red. Upon this base appear small pustules, which later present an ulcerated surface. Several such ulcers may run together. Such a sore, if not kept clean, rapidly tends to extend and the ulceration to deepen. The number of such sores on a given patient may vary from one to one hundred or more. Heydenreich found 16,036 ulcers upon 1285 patients.

Microscopic examinations of the secretions have shown in Oriental ulcer a diplococcus which closely resembles the gonococcus.

The treatment has been somewhat difficult. Commonly, antiseptics such as iodoform have been employed, but under such treatment the ulcers have healed very slowly. The use of tincture of iodine has sometimes caused a rapid healing, and again it has been necessary to curette the ulcer and apply an antiseptic. The treatment with Finsen's light rays has proven very successful in the writer's hands. It was tried in a case in which the ulcer was upon the face, and in which it was desirable to have as little scarring as possible. Hence the curettement was not done. In the ulcer, as in tubercular processes, the light rays produced a certain reaction, and this aided materially in the healing.

Adrenalin Substance in the Intestinal Hemorrhage of Typhoid Fever.—COLEMAN, W. *Medical News*, vol. lxxx, No. 13, p. 597, March 29, 1902.

Five cases of intestinal hemorrhage in typhoid fever were treated by the administration of adrenalin substance. Four of the patients recovered, though in two the hemorrhage was very severe. The fifth patient died of toxemia and exhaustion several days later, and not of hemorrhage, as was demonstrated by the autopsy. In view of the success which the writer has had with the administration of this substance in typhoid fever, a routine procedure is to order a few five-grain powders to be kept in the sick-room and to instruct the nurse to administer one powder when blood first appears in the stools.

A case of purpuric hemorrhage, with severe bleeding from the nose, gums, and bowels, was successfully treated by the administration of suprarenal gland. An idea of the severity of the hemorrhage will be given when it is stated that the patient was compelled to sit up in bed and hold a basin to catch the blood which was continually flowing from the nose and mouth. Fifteen grains of adrenalin substance and calcium chloride was administered three times a day, and at the end of six days the hemorrhage ceased.

Tuberculin in the Diagnosis of Consumption.—WOOD, C. M. *Journal of the American Medical Association*, vol. xxxviii, No. 16, p. 996, April 19, 1902.

The writer thinks that in tuberculin we have a valuable means of diagnosticating early tubercular involvement where other signs are absent. There are cases in which there is no sputum for examination, or the stethoscopic findings are inconclusive and there is no fever. In these doubtful cases tuberculin is helpful, and at the same time harmless. The principal objection to tuberculin is that it may do harm, and this opinion has been accentuated by the large doses

that have been used in the past. He has employed it in 250 cases, some receiving as much as .015, and he has carefully observed its effect on the course of the disease, and in not a single case did the dose either accelerate an active process or light up a quiescent one. The characteristic tuberculin reaction is shown by a rise of at least two degrees in the temperature, reaching its height in from six to thirty-six hours after the injection, and accompanied by at least two of the following symptoms: chilliness, headache, nausea, and muscular pains. The tuberculin test ranks in value with the Widal typhoid test, the technique is simpler, and the information obtained is scarcely less reliable.

Methylene Blue as a Sedative.—HUGHES, D. E., and LOVELACE, E. *Philadelphia Medical Journal*, vol. ix, No. 12, p. 532, March 22, 1902.

Twenty-two cases are reported in which this drug was used as a sedative in the insane and detention wards of the Philadelphia Hospital. They were nearly all cases of wild excitement, and in only six did the drug fail to produce a calming effect. There was a marked difference in the sedative action of this and other drugs, the methylene blue seeming to produce a natural quiet; the excitement disappeared, but there was no paleness nor hebetude. Depression resulted in only one case. In most of the cases the patient slept well at night, but in none did it produce sleep during the daytime. In one case the administration of the drug was followed by vertigo, but this could not with certainty be attributed to its administration. One patient received the drug hypodermically for fourteen days, and the time of administration by the mouth in some of the other cases extended to forty-two, thirty-nine, twenty-two, twenty-one, and fifteen days respectively. The results of the treatment of these cases entitle the drug to be classed as a sedative.

Suprarenal in Pneumonia.—GRAY, E. A. *Medical Record*, vol. lxi, No. 14, p. 527, April 5, 1902.

Having observed the favorable influence of suprarenal in pulmonary hemorrhage, the remedy was given to two cases of pneumonia. In one case the bloody and almost fluid sputum was rapidly checked and there was a prompt recovery. Another case was that of a woman 65 years of age who had been diabetic for ten years, and who developed a complicating nephritis in April which lasted until June, when the pneumonia started.

In both of these cases the heart reacted quickly and steadied itself, with a reduced pulsation. The writer has used the remedy in

a case of asthma with coexisting albuminuria, in a patient 78 years of age. The pulse, which was 100, thready, and hard, dropped in a few hours to 82.

The writer concludes that in this remedy we have a valuable heart stimulant which can be used in cases where heart failure is impending, or where there is coexisting renal inflammation. He enjoins the use of a uniform product of the suprarenal, or, better, its active principle.

The Treatment of Glycosuria, Albuminuria, and Hemorrhages by Gelatin.—LAFFONT, M., and LOMBARD, A. *Le Progrès Médical*, vol. xiv, No. 14, p. 217, April 5, 1902.

The writers have found that gelatin is valuable in the treatment of albuminuria and glycosuria. The suggestion for the employment of this substance in the treatment of these disorders was furnished by the alteration of the freezing-point of the blood indicating a lessened plasticity of the blood. They employed a dose of fifteen grammes. If a greater quantity than this is administered, it is eliminated by the feces; if a less quantity, the therapeutic results are not obtained. In hemoptysis the gelatin is administered cold. In other cases it is preferable to give it warm, in the form of bouillon, as the water facilitates absorption and it is not nearly so disagreeable to take.

The Substitution of Chlorides by Bromides.—HONDO, T. *Berliner Klinische Wochenschrift*, 39th year, No. 10, p. 205, March 10, 1902.

The bromides are rapidly eliminated upon an ordinary mixed diet. After administration the elimination begins promptly and continues for about ten days after its withdrawal. The quantity then diminishes, but small traces can be found months after the withdrawal of the drug. When the chloride of sodium is markedly diminished in the diet, the elimination of bromide is much smaller in quantity and takes a longer time. The effect of diminishing the chlorides in the diet, if not carried below three grammes, is to cause very little alteration in nutrition if the diminution is not kept up too long.

The X-rays in the Treatment of Superficial Abscesses.—SHAND, J. C. *Australasian Medical Gazette*, vol. xxi, No. 3, p. 126, March 20, 1902.

An interesting case of recurring abscesses which had been treated for a number of months without improvement yielded promptly to the *x*-rays. The patient, a girl five years of age, for eighteen months had suffered from recurring superficial abscesses, in which

the staphylococcus pyogenes aureus was always found. The cicatrices of hundreds of these abscesses were found all over the body. First the rays were applied cautiously, but the beneficial effects being noted, they were given for a somewhat greater length of time, and after the first application there was a cessation of the suppuration. Later they returned, but again yielded to the same application. At the date of the report two months had elapsed, and the child was convalescent. There were no signs of recurrence of the disease.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Pyloric Stenosis in Infants. — SAUNDERS, E. W. *Archives of Pediatrics*, vol. xix, No. 4, p. 241, April, 1902.

The clinical picture presented by pyloric stenosis in an infant is fairly uniform. It occurs in those from one day to three months old, and has no apparent cause. An early symptom is vomiting, which is usually attributed to indigestion. Under a regulated diet and treatment, this ceases temporarily; later the vomiting becomes worse and is projectile. There is obstinate constipation and a rapid loss in weight. The physical signs may be negative; a palpable tumor of the pylorus is frequently found, and dilatation of the stomach occurs. The upper zone of the abdomen bulges, contrasting with the depressed lower zone. The bulging of the epigastrium subsides after a paroxysm of vomiting. An examination of the stomach contents shows that the viscus does not empty itself in one or two hours. In some cases hydrochloric acid is in excess, but more often it is diminished or absent. With the gastric dilatation there develops a catarrh of the stomach. There is decomposition with the production of the organic acids. Large quantities of mucus are vomited at intervals, and the general condition of the infant becomes steadily worse.

Post-mortem examination in these cases shows a thickened pylorus with marked stenosis. The hypertrophy is largely of the circular muscular fibers, but the longitudinal, the mucous, and the submucous coats partake in the overgrowth.

Two theories have been advanced as to the nature of the trouble: One that there is a congenital redundancy or a partial overgrowth of muscular tissue; another attributes it to a functional disturbance of the nervous system leading to a spasm and a secondary hypertrophy of the pylorus.

In the treatment of the condition medical means should be first

employed. An effort should be made to overcome the spasm by the administration of bromide and chloral. In one case atropine seemed to be useful. Opiates should not be given, as the motor function of the stomach is impaired. The secondary gastric dilatation should be relieved by lavage, and the stomach so far as possible placed at rest, employing for this purpose rectal feeding. When food by the mouth is given, the stomach should be occasionally washed out. In giving foods by the stomach, those should be given which do not form a coagulum. Whey or peptonized milk, to which some cream may be added, is a useful mixture for stomach feeding. When it is seen that the infant is failing in spite of treatment, surgical intervention must be advised. So far the operations have been too few to determine the best method of relieving the trouble. Two successful operations have been recorded. Hahn advises the digital dilatation of the pylorus by invaginating the wall of the stomach without opening the viscus.

The Treatment of Puerperal Convulsions.—Ross, T. H. *New York Medical Journal*, vol. lxxv, No. 14, p. 611, April 5, 1902.

The importance of preventing eclamptic seizures is emphasized. The writer has conducted 582 cases of labor, and in no instance have puerperal convulsions occurred, although he has seen several in which the premonitory symptoms were recognized. The liver is the most important organ in the puerperal period, and disturbances of the health of the pregnant woman characterized by hyperemesis, hysteria, insomnia, and headaches should always lead to a careful investigation of the hepatic function. In addition to the correct hygiene and dietetics of pregnancy, a daily dose of the following may be given for its effect upon the liver:

Euonymin	1-8 grain.
Calomel	1-8 grain.
Ipecac	1-8 grain.
Aloin	1-12 grain.
Podophyllin	1-20 grain.

This is the average dose, but the rule is to give just sufficient for a thorough bowel movement once a day. Even in cases where there are no symptoms of autointoxication, such a pill may be given alternating fortnights during the puerperal period. The systematic treatment of the liver confers a marked immunity to puerperal convulsions, and many of the lesser ills which occur during the puerperal period. The kidneys should be carefully watched, but where the hepatic functions are normal, if the kidneys are not diseased they will perform their functions. Constipation and autoin-

toxication are the great causes of depression during the puerperal period, and where a patient will not follow a proper diet the more damaging effects of improper food will be overcome by proper medication of the alimentary tract.

If the patient develops signs of puerperal convulsions, she should be placed in a quiet, clean, plainly furnished room, under the care of a good nurse. Epsom salts or calomel should be given at frequent intervals, in divided doses. In addition, the bowels should be emptied as high as possible by flushing with normal salt solution.

Veratrum viride, in frequently repeated and increasing doses, is to be given. If it is rejected by the stomach, a good fluid extract may be used hypodermically. This treatment is suitable for the average case, but in patients who are anemic and depressed a normal salt solution may be introduced directly into the circulation.

In the treatment of the developed convulsions, the same plan of clearing out the alimentary tract should be followed, and in cases in which the face is flushed and the pulse rapid and of high tension, veratrum viride should be given hypodermically until its physiologic effects are produced. Begin with from eight to ten minims subcutaneously and wait fifteen minutes. If there is no lowering of arterial pressure, then give five minims. Watch the circulation closely, and as soon as there is a rise in arterial tension, repeat the dose. The pulse should be kept below 80, or better, between 70 and 75. For the control of the convulsions before the veratrum can act, chloroform may be used, or morphine can be given subcutaneously. If the convulsions come on at or near term, the uterus should be emptied at once.

Stricture of the Rectum in Women, Due to Inflammatory Processes in the Pelvis.—ROTHROCK, J. L. *St. Paul Medical Journal*, vol. iv, No. 5, May, 1902.

The literature contains occasional reference to inflammatory processes in the pelvis as the cause of stricture of the rectum. The number of reported cases are very few. During the past five years three examples of stricture due to this cause have come under the writer's observation, one so complete as to require colotomy, and the other two causing serious inconvenience. The case requiring colotomy was that of a married woman, aged 42, who after lifting heavily was taken with severe pain in the abdomen, which at first centered about the umbilicus, and later became localized in the right ovarian region. She was admitted five days later to the hospital

with a rapid pulse and slight elevation of temperature. On examination, the abdomen was somewhat distended, with increased tension in the right ovarian region. During the next few weeks the temperature fluctuated within narrow limits and was never high. Nineteen days after admission the temperature suddenly went up to 103° F., and a vaginal examination showed the uterus firmly fixed in a hard exudate. On July 18 the cul-de-sac was opened, but no pus was found in the inflammatory mass which now filled the pelvis. There was obstinate tympanites, which gradually grew worse. The uterus was fixed in a hard, inflammatory mass, and upon rectal examination an infiltration could be felt compressing a portion of the rectum. At the end of two months an exploratory laparotomy was made, and as no pus was found an inguinal colotomy was performed. On opening the intestine a firm exudate was found surrounding the upper portion of the rectum, and there was marked infiltration of its walls. The constriction was so narrow that only the tip of the finger could be introduced for a short distance. From this time on the patient improved, and some five months later the exudate was markedly diminished and the patient began to have stools by the natural passage.

The remaining two cases were not so severe, but in all the location of the stricture was in the upper portion of the rectum. A probable reason why stricture does not more frequently occur in inflammatory conditions of the pelvis is that pressure alone seldom causes obstruction. When it does occur, there is usually an associated perirectal infiltration.

The Supposed Infectivity of the Desquamative Period of Scarlet Fever. —MILLARD, C. K. *Lancet*, vol. clxii, No. 14 of vol. i, p. 959, April 5, 1902.

Issue is taken with the view that the desquamative period of scarlet fever is eminently contagious. This commonly accepted doctrine received its strongest support from the Clinical Society of London, which in 1892 stated that infection persists so long as there is any desquamation, and may still be active at the end of eight weeks. The evidence upon which this emphatic and unqualified statement is based is of the scantiest and most non-conclusive description. Out of 209 cases reported, only three had the slightest bearing upon the question of the infectivity of desquamation. So firm is the belief that a desquamating patient is infectious that actions at law have been repeatedly based upon it, as if it were a settled fact.

To obtain information upon this point, letters were sent to a

number of superintendents of fever hospitals, and in all twenty-one replies were received. Of these, sixteen said that they could adduce no evidence that desquamating epithelium is a source of infection, and considered that too much importance has been attached to it in the past. Their experience does not support the popular view that desquamation after scarlet fever is necessarily an indication that a patient is still infectious, and they believe that a patient may continue to desquamate for some time after he has ceased to be infectious.

A Bacteriological Examination of the Throats of Seventy-five Cases of Scarlet Fever. — ARMAND-DELILLE, M. P. *Archives des Médecine des Enfance*, vol. v, No. 4, p. 202, April, 1902.

As a result of this examination, the writer concludes that in as large a proportion as 32 per cent of the throats of infants having measles there is found by culture a bacillus which resembles that of Klebs-Loeffler, but it is rarely virulent. If it is discovered that the bacillus is virulent, there is almost invariably found a pseudomembranous angina. In cases of measles presenting symptoms of croup, neither the diphtheria bacillus nor the pseudodiphtheria bacillus was found. The morphological character of the bacillus on serum or agar does not permit us to determine its virulence. The long and short bacilli are non-virulent, as well as those that do not cloud bouillon, and which, grown upon agar, form small, gray colonies. The virulent bacilli are those of medium length, which promptly cause a cloudiness in bouillon.

As a result of these observations the practical deduction is made that in prophylaxis and therapeutics importance cannot be attached to the cultural reactions of the bacilli found in the throat. Without inoculations it is impossible to distinguish the croup of measles from diphtheritic croup. It is wise, both in hospital and civil practice, in each case of measles with throat symptoms, to give a dose of antidiphtheritic serum.

Diseases of the Kidney and Bladder in Infancy. — MORSE, J. L. *American Medicine*, vol. iii, No. 14, p. 551, April 5, 1902.

The examination of the urine in infancy is much neglected by diagnosticians. During the past two years the writer has examined the urine of every infant coming under his observation. The results confirm him in the view that the examination of the urine should never be omitted, as diseases of the kidneys and bladder are not at all uncommon in infancy, and the examination of the urine in cases in which diseases of the urinary organs are suspected will often

make a diagnosis possible in doubtful cases. The absence of symptoms pointing to involvement of the kidneys is not sufficient, as symptoms of urinary disturbance in infancy are rarely characteristic; the urine should be examined as a routine procedure. It is the rarity of these examinations that has led to the belief that diseases of the urinary organs are uncommon in infancy.

FORENSIC MEDICINE.

Privileged Communications.—CHEEVER, D. W. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 12, p. 304, March 20, 1902.

The writer has some suggestions to offer in relation to the vexed question of privileged medical communications. On the one hand, the law as it stands in Massachusetts affords no protection to the physician, holding that he must reveal all secrets imparted to him. The New York law, which excludes all statement by the physician of what he may have learned in the progress of a case, has worked considerable hardship in the administration of the law. Not only have physicians been unable to protect themselves from charges of malpractice, but suits have been unquestionably instituted and maintained because of the fact that valuable evidence was in this way suppressed.

The writer proposes that the law should recognize the rights of the patients, the duties of the medical man, and also justice to the community. The statute of New York should be modified in so far as it should be considered unprofessional for a physician to divulge anything concerning a patient unless (1) with the patient's consent; (2) to defend himself when accused; (3) to expose crime; (4) in all other cases such professional confidences shall be classed as privileged communications. It shall be left to the physician to say when it is his duty to reveal such facts, and if he conscientiously declines, he should be protected. If it should be required that such facts be brought out, they should only be before the judge in private, and no such revelations should be made public.

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

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FIG. 1.—Cow A45030. Inoculated with culture of tubercle bacillus isolated from mesenteric gland of child. Section of lung. (See p. 537.)

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ORIGINAL ARTICLES.

THE INTERCOMMUNICABILITY OF HUMAN AND BOVINE TUBERCULOSIS.*

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[From the Laboratory of the State Live-stock Sanitary Board of Pennsylvania.]

The past decade has seen the awakening of a wide-spread interest in the study of tuberculosis, the spirit of Oriental fatalism which has for so long led us to view with equanimity the awful loss of life annually inflicted by this great white plague having given way to an active campaign against its ravages, a campaign so far largely one of education, in which we strive to spread far and wide the fundamental facts that tuberculosis is a communicable disease, and, from that fact, preventable. If preventable, why not prevented? With these precepts firmly implanted in the minds of the medical profession, as well as of the general public, we have reason to hope that each year will see a more careful study of the methods by which tuberculosis is spread and the means to be adopted for its prevention. On every hand societies for the prevention of tuberculosis are being formed whose object is to teach the truth concerning the disease and to dispel those false notions, chief among which may be mentioned belief in the hereditary character of tuberculosis, which in the past have led us to regard the tribute of human life as inevitable.

The intelligent prophylaxis against any disease demands a thorough understanding of the methods by which it is spread. The whole world is in accord in assigning the chief rôle in the propagation of tuberculosis to the inhalation of particles of sputum thrown

*An address delivered at the Annual Conversational Meeting of the Pathological Society of Philadelphia, on Thursday evening, April 24, 1902, with omission of certain details.

off by phthisical persons, the majority of the profession agreeing with Cornet in the belief that sputum is most dangerous when dried and pulverized, while others follow Flügge in regarding the moist floating particles thrown out during coughing, sneezing, etc., as most to be feared. The danger to mankind from tuberculosis of cattle has been discussed at a length and with a fervor not surpassed in the history of modern medicine. The immense practical importance of the subject to the medical profession, to those charged with making and enforcing laws for the preservation of the health of the community, no less than to every man, woman, and child, justifies our deepest interest and most earnest studies.

The relation that exists between human and bovine tuberculosis, and the part played by cattle in spreading the disease among mankind, is now the great question, to which attention has been drawn with renewed activity by the attitude of Professor Koch, announced in his paper before the British Congress on Tuberculosis, in July, 1901. This paper was the more striking in that it contained statements diametrically opposed to the former teaching of Koch that "bovine tuberculosis is identical with human tuberculosis, and is thus a disease transmissible to man."[1] This belief was the outcome of the experiments made by Koch at the time of his discovery of the tubercle bacillus, and has been generally accepted by the medical and veterinary professions up to the present time. So much has been written of late on the subject that I will pass over minor differences of opinion and at once take up the consideration of the two main propositions which were formulated by Koch, and which include all points of controversy in the discussion of the relation between human and bovine tuberculosis.

1. "Human tuberculosis differs from bovine and cannot be transmitted to cattle."

2. "Though the important question whether man is susceptible to bovine tuberculosis at all is not yet absolutely decided, and will not admit of absolute decision to-day or to-morrow, one is nevertheless already at liberty to say that if such a susceptibility really exists the infection of human beings is but a very rare occurrence. I should estimate the extent of infection by the milk and flesh of tuberculous cattle, and the butter made from this milk, is hardly greater than that of hereditary transmission, and therefore do not deem it advisable to take any measures against it."

I. The first of these propositions is susceptible of direct experimental investigation, and can therefore be answered positively without going into the domain of theory. Professor Koch based this

statement on the result of an insufficient number of experiments done by Professor Shütz and himself. A number of young cattle proved to be free from tuberculosis by the tuberculin test were infected in various ways with the bacilli of human origin or with tubercular sputum. "In some cases the tubercle bacilli or the sputum were injected under the skin, in others into the peritoneal cavity, in still others into the jugular vein. Six animals were fed with tubercular sputum almost daily for seven or eight months; four repeatedly inhaled great quantities of bacilli, which were distributed in water and scattered with it in the form of spray. None of these cattle (there were nineteen of them) showed any symptoms of disease, and they gained considerably in weight." After six to eight months they were killed, and no trace of disease was found in the internal organs. Where the injections were made small foci of suppuration had formed in which there were found a few bacilli.

Inoculations of a similar nature with bacilli from the lungs of an animal with bovine tuberculosis resulted always in rapid illness, ending often in death, while some were killed in a miserably sick condition after three months. In all cases there was extensive tuberculosis, involving the internal organs, especially the lungs and spleen.

A similar difference in pathogenic power was found in feeding experiments on pigs, where one lot of six received human tubercular sputum, and a second lot of six were given pure cultures of the bovine tubercle bacillus; and also in experiments on asses, sheep, and goats, where the inoculations were made with pure cultures of human and bovine bacilli into the circulation.

Results similar to these in the main have been obtained by Smith,[2] Frothingham, Dinwiddie,[3] and at the laboratory of the State Livestock Sanitary Board of Pennsylvania,[4] and we may admit that, as a rule, cattle show a high degree of resistance to the human tubercle bacillus, and that for all experimental animals the bovine bacillus has a pathogenic power equal to the human bacillus, while for the great majority it is vastly more pathogenic; but this does not by any means show that man is not susceptible to infection by the bovine organism, and we have abundant proof that it is quite possible to infect cattle with the tubercle bacillus from human sources.

The identity of tuberculosis as seen in man and in cattle was held by Villemin, who believed he had proved the correctness of this view in his inoculation experiments, by which he showed conclusively that small animals like rabbits became tuberculous following the injection of material from man as well as cattle. Chauveau[5]

was, however, the first to make the attempt to infect cattle with tubercular material from man, and his success is shown in the following abstract of his experiments:

FIRST SERIES.—*Infection by the digestive tract.* Three animals were used, and as controls there were three other similar animals which were infected with bovine material, and also three which were not infected at all, these last remaining free from tuberculosis. Those to which bovine material had been fed, as well as those which received human material, all became tuberculous. At the autopsy it was impossible to distinguish one set from the other. In all of them the lesions provoked showed the same character.

SECOND SERIES.—*Infection by intravenous injection.* A calf, three months old, was inoculated into the jugular vein with two cubic centimeters of an emulsion made from the lung of a child with acute miliary tuberculosis. It was killed on the twenty-ninth day. The lesions were confined to the chest, the bronchial and mediastinal ganglia showing the most marked changes. In the lung, on section, there were found well marked gray granulations accumulated in the interior or around the small bronchi, which they sometimes occluded entirely. This was well seen with the naked eye, but was better demonstrated in microscopical sections.

THIRD SERIES.—*Infection by subcutaneous inoculation.* Seven animals were inoculated. For three animals the material used was obtained from fungus masses from the joints in cases of white swelling; for three others from acute miliary tuberculosis; and in one from the lung of a horse which had developed a marked pulmonary tuberculosis due to the intravenous injection of material from the lung of a man. In all cases a tumor developed at the point of inoculation, which Chauveau describes as being a tuberculous tumor altogether typical. The neighboring glands showed always more or less involvement, but in no case was there any general infection.

I have quoted these experiments at some length for the reason that they seem often to be overlooked, and for the further reason that they have recently been directly misquoted. Indeed, Koch himself said in his address before the British Congress on Tuberculosis: "If one studies the older literature of the subject, and collects the reports of the numerous experiments that were made in former times by Chauveau, Gunther and Harms, Bollinger, and others, who fed calves, swine, and goats with tubercular material, one finds that the animals that were fed with the milk and pieces of the lungs of tubercular cattle always fell ill of tuberculosis, whereas those that received human material with their food did not."

Bollinger,[6] in 1879, inoculated a young calf in the peritoneal cavity with material from a human lung. When killed after seven months the mesentery and peritoneal covering of the spleen presented a number of tumors from the size of a pea to that of a walnut, and which microscopically were identical with those found in pearly disease under natural conditions. The retroperitoneal and mesenteric glands were tuberculous also.

Klebs[7] caused a tuberculosis of the peritoneum identical with what is seen under natural conditions by the intraperitoneal injection of human tubercular material. Kitt,[8] also, is quoted by Professor Johne as having had a similar result accompanied with generalized lesions following the intraperitoneal injection of the juice from a scrofulous gland taken from the neck of a man.

Crookshank[9] injected tuberculous sputum into the peritoneal cavity of a calf, causing death on the forty-second day. The autopsy revealed extensive disease. "Extending over the mesentery from the point (inoculation) there were hundreds of wartlike, fleshy, new-growths, some quite irregular in form, others spherical or button-shaped. There were similar deposits on the under surface of the liver, on the spleen, in the gastrosplenic omentum, and on the peritoneal surface of the diaphragm. On microscopical examination extremely minute tubercles were found disseminated throughout the lungs and liver. Tubercle bacilli were found in these organs and in the peritoneal deposits."

Sydney Martin[10] fed human tuberculous sputum to six calves. Four of these received each 70 cubic centimeters mixed with their food at one meal. They were killed after thirty-three, sixty-three, eighty-five, and two hundred and eighty-five days. The first three showed respectively fifty-three, sixty-three, and thirteen tubercular nodules in the intestine, while the fourth was entirely free. The two other calves were given 440 cubic centimeters of sputum at one feeding. One was killed after fifty-six days, and showed tuberculosis of the intestine and mesenteric gland. The other was allowed to live one hundred and thirty-eight days, and was free from disease when killed.

At the recent Congress on Tuberculosis, Professor Thomassen,[11] of Utrecht, reported the following experiment: A calf, four weeks old, was inoculated in the anterior chamber of the eye with a pure culture of the tubercle bacillus isolated from a case of tuberculous arthritis in man. An intense keratitis was set up, the cornea becoming so opaque that it was impossible to observe the alterations in the iris. It was killed after six weeks, and was found to be the

victim of a pretty well generalized tuberculosis. Both lungs contained numerous miliary tubercles and some gray fibrous tubercles of larger size. The path of infection from the eye to the lung was mapped out by the condition of the subparotideal, cervical, mediastinal, and bronchial lymph glands of the same side.

Nocard[12] states that by inoculation into the arachnoid cavity of a small amount of human tubercle bacilli a rapidly fatal tubercular meningitis is set up identical with that seen in children. A calf, five months old, was thus inoculated by him on August 2, 1901, and died on the 28th of the same month, the pia mater being infiltrated with tubercles which proved virulent for guinea-pigs.

On the same day Nocard injected into the jugular of a cow which had become much reduced by chronic diarrhea, but which was free from tuberculosis as shown by the tuberculin test, one cubic centimeter of a suspension of human bacilli. She died September 4, and showed a number of small foci, softened or caseous and extremely rich in tubercle bacilli. He considers that in this case the animal was so weakened by the preëxisting diarrhea that its normal resistance was largely destroyed.

De Jong,[13] as the result of a series of comparative inoculations of human and bovine tubercle bacilli, states that seven cattle—namely, two calves six months old, three steers two years old, and one eighteen months, and one calf seven or eight months old—all became tuberculous by the injection of pure cultures of the human tubercle bacillus. In only one of the seven was the disease grave and wide-spread; in four the lesions were retrogressive, and in the two remaining ones progressive.

Arloing[14] reports the following recent experiments: Three cultures of human origin were used, one of which had been under cultivation since 1896. With this culture a heifer, two years old, and a young calf were inoculated intravenously. The calf was killed after thirty-two days, and showed a typical eruption of minute tubercles all through both lungs, but especially marked in the anterior lobes. The heifer was kept for one hundred and twenty days, and was only slightly diseased, the lungs and pleuræ being involved. With the second culture, obtained from a case of pleurisy, a calf two and one-half months old was inoculated intravenously. Death ensued after seventeen days. The lungs alone were involved, showing many young nodules. The third culture was isolated from a case of pleuropericarditis, with involvement of the lungs, and with this a young bull convalescent from aphthous fever was inoculated intravenously, death resulting in thirty-two

days. The thoracic cavity was principally involved, the anterior and middle lobes containing nodules throughout, and some lobules of the posterior lobes also. The bronchial and esophageal glands were tremendously enlarged, weighing thirty-five kilogrammes.

It may be objected to many of these experiments that the tuberculosis resulting from the inoculation did not cause death nor even serious illness, and it is probable that some of the animals would have recovered entirely if allowed to live. Admitting freely the truth of this, it may be pointed out that under natural conditions many cattle infected with bovine tuberculosis will remain for years apparently in perfect health, so much so that detection of the disease is possible only by means of tuberculin. So, also, in man many cases of tuberculosis run a benign course, or remain stationary for years, while not a few end in recovery. Yet in man and in animals these benign cases may take on an acute form and end in rapid death, owing to some intercurrent affection which lowers resistance or permits the engrafting of a secondary infection. No one would hold that because of the benign course of the disease in the first instance true tuberculosis did not exist.

Transmission of Tuberculosis to Cattle from Phthisical Attendants.—There are on record a few instances of cattle becoming infected with tuberculosis through the sputum of phthisical attendants. In several of these the evidence is so clear as to leave no doubt that cattle are at times infected in this manner. Such instances have been reported by Cozette,[15] Cliquet,[16] Huon,[17] Director of the vaccine laboratory at Marseilles, and Bang.[18] In most of these cases the sputum was introduced into the digestive tract with the forage, as well as inhaled in the dry state, but in Huon's animal the infection seems to have been entirely through inhalation.

Experiments at the Laboratory of the State Live-stock Sanitary Board.—I come now to speak of the work done at the laboratory of the State Live-stock Sanitary Board, the results of which you see illustrated in the specimens presented here for your inspection and study. I cannot but feel that these specimens possess an unusual interest and importance in the solution of a problem which is now engaging the attention of scientific men throughout the world, and which has been made the subject of special investigation by the governments of many countries. Our first successful attempt to infect cattle with human tuberculosis was made in 1898, when four calves of nearly the same age, four to five weeks old, received intraperitoneally 10 cubic centimeters of human tuberculous sputum, from different sources, but in all cases containing a large number of

bacilli. One showed no ill effects except a slight rise in temperature, and the autopsy was entirely negative. Of the other three, two had persistent high temperature following the injection, but only one showed marked illness otherwise. Post-mortem examination proved that all had become infected with tuberculosis, the lesions in two being quite extensive.

For several years past we have endeavored to obtain material from cases of tuberculosis in children in whom there was evidence of infection through the alimentary tract, reasoning that if children contracted tuberculosis through the ingestion of milk from diseased cattle, we would be most apt to find bacilli of the bovine type in these intestinal or mesenteric lesions. So far only three such cases have come to us, all through the kindly interest of Dr. Alfred Hand, and in only one of these was the evidence of primary intestinal infection clear. We have isolated from the mesenteric gland of this child, the immediate cause of whose death was tubercular meningitis, a culture which has for cattle the most intense pathogenic power. Two calves inoculated into the jugular vein and peritoneal cavity died in nineteen and twenty-seven days respectively; and a grown cow which was inoculated both in the jugular vein and peritoneal cavity died in eighteen days. All of these animals exhibited marked symptoms from the day of inoculation. Examination of the lesions, both macroscopical and microscopical, leaves no doubt that the animals succumbed to a pure tuberculosis. The details of these cases are as follows:

History of Culture.—Designation BB. Obtained from a child seventeen months old. Death was due to tubercular meningitis. Autopsy: Lungs normal, except posterior part of right upper lobe, which was consolidated, red on section, and had excess of connective tissue. Bronchial and mediastinal glands not enlarged. Spleen, liver, and kidneys showed pearly tubercles. Two feet from lower end of ileum was an ulcer 1 by 2 centimeters, the long diameter transverse to axis of gut. Nodules were seen on peritoneal surface. Four small ulcers, two above and two below, were found in ileum. Mesenteric glands enlarged, cheesy, and some purulent. Meninges showed yellow tubercles, most marked along longitudinal fissure, in choroid plexus, and over cerebellum. The mesenteric glands were used in obtaining the culture.

This case is considered by Dr. Hand the clearest one of primary intestinal tuberculosis ever seen by him.

Guinea-pigs were inoculated intraperitoneally with an emulsion made from the mesenteric glands on March 9, 1901. One was chlo-

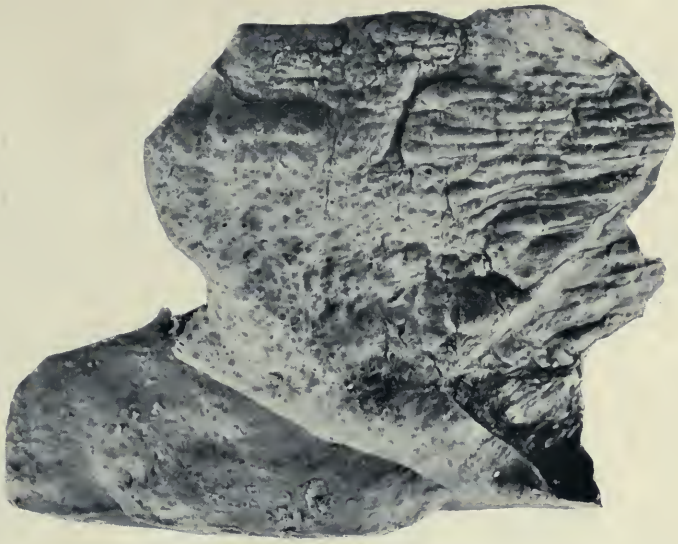

FIG. 2.—Calf 26597. Inoculated intraperitoneally with culture BB, obtained from mesenteric gland of a child. Portion of liver with omentum which was adherent turned back.

FIG. 3.—Calf 16597. Inoculated intraperitoneally with culture BB, obtained from mesenteric gland of child. Portion of abdominal wall.

roformed on April 19 and cultures made. Scanty growth on one tube was found June 8, and subcultures made.

Calf No. 26596, weight 132 pounds. Tested with tuberculin, but gave no reaction. On December 4, 1901, 5 cubic centimeters of a suspension of the fifth and sixth generation of culture BB was injected into the right jugular vein. On the next day the temperature had risen to 103.2° F. After a slight remission it rose to 103° F. on the seventh day after inoculation, and continued to rise each day, reaching 106.4° F. by the fourteenth day, after which it fell slightly until death, which took place on December 21, seventeen days after inoculation. The animal showed marked illness during life, the respiration reaching 68 per minute.

Autopsy: The lungs and the related glands showed macroscopically the most marked disease. Both lungs were thickly studded throughout, with remarkable uniformity, with miliary nodules, giving a sandy feel under the finger. The left was pneumonic, owing to the position of the calf for some time before death. Portions of the right were in a similar condition, sinking when placed in water. The bronchial and mediastinal glands were much enlarged and soft, and in the former small areas of caseation were found. The liver was large, soft, and friable. Several nodules were visible on the surface, though not perceptible to the touch. The spleen showed very slight changes. The kidneys were normal.

Calf No. 26597, weight 202 pounds. Tested with tuberculin, and gave no reaction. On December 4, 1901, 5 cubic centimeters of a suspension of culture BB of the fifth and sixth generations was injected into the peritoneal cavity. The temperature rose to 105.2° F. by the eighth day after injection, remaining very nearly the same until four days before death, when it began to fall, and reached 103° F. on the day before death, which took place on December 31, or twenty-seven days from the time of inoculation.

Autopsy: Great emaciation. Loss in weight thirty-seven pounds. The lungs were largely involved, though not uniformly. The central and posterior portions showed many areas deep red in color and solid to the feel. These were thickly studded throughout with minute grayish nodules. The supra-sternal lymph glands were as large as goose eggs, and contained cheesy areas. The mediastinal glands were much enlarged, one being six inches in length by two inches in diameter. The peritoneal cavity contained about six quarts of straw-colored fluid. The peritoneum was everywhere enormously thickened, and practically converted into a tuberculous mass. In several places it was one-half an inch thick and fibrous. The omentum was also enormously thickened and bound over the surface of the liver. It contained a great number of nodules, dense and fibrous, many with caseous centers. The liver was firmly adherent to the diaphragm, and on section showed many nodules. The spleen was firmly attached to the surrounding parts by a mass of partly organized fibrin, which contained many cheesy nodules. On section it appeared to be normal.

Cow No. A45030, about three years old, and weighing 660 pounds. On January 22, 1902, 2½ cubic centimeters of a suspension of culture BB of the seventh and eighth generations was injected into the right jugular vein, and the same amount into the peritoneal cavity. The temperature rose to 103.2° F. on the second day, then fell slightly during the next six days, after which it rose

steadily, reaching the maximum, 107° F., three days before death, after which it fell slightly, the animal dying seventeen days after inoculation. The lungs were mostly involved, both being thickly studded throughout with miliary nodules. Most of the left lung showed interlobular emphysema, while the inferior portion was much congested. On the omentum were numerous dark-red spots which could be felt between the fingers. The spleen was adherent to the diaphragm, and there were many punctate hemorrhages on the surface. The liver and kidneys showed no gross changes.

What interpretation is to be given to these remarkable results? One of two propositions must be admitted: either we have found a human tubercle bacillus having a pathogenic power for cattle quite as great as any bovine germ; or else we have found in the mesenteric gland of a child the bovine tubercle bacillus. If we accept the law of diagnosis laid down by Koch, namely, the inoculation test, the latter is the true explanation. I, myself, am strongly of the opinion that this latter is the case for the following reasons:

1. The history of the case as given by Dr. Hand, primary intestinal infection.

2. Morphologically and culturally the organism corresponds more nearly to the bovine type as first defined by Dr. Theobald Smith, and later by ourselves, than the human.

3. The great pathogenic power for cattle.

A second culture obtained from the mesenteric glands of a child has shown a virulence far in excess of that usually found in human cultures, though it falls short of culture BB in pathogenic power. This culture, designated U, was isolated in December, 1900, and tested on guinea-pigs and rabbits. The results, together with its manner of growing and microscopical appearance, led us to consider it a typical human culture. During the summer of 1901 it was selected for some feeding experiments on puppies, and showed a degree of virulence that was not expected. In December last, wishing to produce a slow tuberculosis in a dog, this culture was again employed. The dog grew ill rapidly, and died in January, thirty-six days from the time of inoculation. Post-mortem examination revealed a typical and extensive tuberculosis, and it was decided to inoculate a calf in order to test its virulence for the bovine race.

On March 4, 1902, Calf No. A45046, weighing 74 pounds, was inoculated in the jugular vein with 6 cubic centimeters of a suspension of culture U, of the twelfth generation, from glycerin agar, the suspension being equal in opacity to a twenty-four-hour-old culture of the typhoid bacillus in bouillon. The animal soon showed signs of illness; the breathing became rapid and labored, reaching 54 per minute. Extreme weakness and depression came on, and it

passed much of the time lying down. On April 19, 1902, it was killed, death seeming imminent.

Autopsy: Weight 82 pounds. Condition fair. The anterior lobes of both lungs were thickly studded with minute nodules, averaging one millimeter in diameter. Blocks from these lobes sank in water immediately. Both lungs were dense and solid to the feel throughout. The posterior lobes were air-bearing for the most part, but contained many solidified areas, which could be seen on the surface as well as on section. The bronchial and mediastinal glands were enlarged and wet. Scrapings from cut surfaces showed an enormous number of tubercle bacilli. In the mediastinal glands many yellowish nodules were seen. The pleuræ were normal. The liver was enlarged and firm to the touch. No distinct nodules could be seen by the naked eye, but throughout the substance yellowish areas were found in large numbers. The surface appeared marbled. The spleen was enlarged and very firm, but no nodules could be detected. The kidneys showed numerous whitish areas on the surface, which were found to extend quite deeply into the cortex. On section many yellowish nodules were seen. The tissues of the kidneys were much stained with bile, and the pelvis contained a gelatinous or viscous material showing the same pigment. The peritoneum was normal.

Microscopical examination: The solidified portions of the lungs contain large areas which are not air-bearing, the alveoli being completely filled with leucocytes and epithelium, or epithelioid cells. The small bronchi are filled by an exudate made up largely of leucocytes. The central portions of the nodules stain poorly, and fragmention of the nuclei of the cells is seen, but no distinct caseation can be found. In sections stained with carbol-fuchsin innumerable tubercle bacilli are seen. In other parts of the lungs which are still largely air-bearing, minute nodules are found in large numbers, having the same general characteristics as those just described. Throughout the sections many tubercle bacilli are seen, and in the nodules they are in clusters. In the liver no typical tubercles are found, but there are many minute nodules made up of round cells, and on the borders of these a considerable number of giant cells with peripheral nuclei occur. Sections stained with carbol-fuchsin show large numbers of tubercle bacilli clustered in these areas. The spleen shows round-cell infiltration, giant cells, and many tubercle bacilli.

The white areas in the kidney described above show a round-cell infiltration and large numbers of tubercle bacilli. The bronchial glands show areas of beginning caseation, a few giant cells, and innumerable tubercle bacilli.

This calf showed a well marked tuberculosis, proving that the culture with which it was inoculated had a degree of virulence above that usually found in cultures of human origin. Our experience with this culture leads us to believe that the usual method of employing only guinea-pigs and rabbits in testing the virulence of the tubercle bacillus does not always give entirely conclusive results. Unfortunately, the expense attending the use of larger animals hinders their more general employment.

History of Culture U.—Obtained from a child three years of age, whose death was due to tubercular meningitis. Autopsy: Lungs

and bronchial lymphatic glands full of miliary tubercles. Anterior mediastinal glands much enlarged. Spleen extensively involved, liver less so. On abdominal surface of diaphragm were a number of flat, yellow nodules. Mesenteric glands enlarged, and contained old, yellow, cheesy nodules. One small tubercle found in the right suprarenal. Purulent and cheesy nodules found in meninges and encephalon. The cultures were obtained from the mesenteric glands.

The pathologist, Dr. Hand, was unable to decide with certainty as to the origin of this case.

*Increase of Virulence by Successive Passages Through Calves.**—In another experiment instituted by Dr. Leonard Pearson we have proved that a typical tuberculosis can be produced in young cattle by large and repeated doses of a human culture of moderate virulence; and, what is even more interesting and important, by successive passages through calves we have succeeded in bringing about a marked increase in the virulence of this culture. The culture employed was isolated from human sputum in September, 1899, and is designated "M."[4] The animals were inoculated at intervals of a week, the amount of culture being divided into four equal portions, which were injected into the jugular vein, the lung, the peritoneal cavity, and under the skin. Each week the dose was increased by 10 cubic centimeters.

Two calves were infected in this manner, Nos. 26562 and 26563. With the tissues of No. 26562 the serial inoculations were begun. The result is shown in the following table:

No.	Amount of injection.	Length of life.
1. Calf 26,562	925 Cc.	106 days.
2. Calf A45,020	16 Cc.	48 days.
3. Calf A45,035	13 Cc.	23 days.
4. Calf A35,047	10 Cc.	24 days.
5. Calf A45,073	14 Cc.	24 days.

Guinea-pigs have also been inoculated in order to recover a pure culture so that any changes that have taken place may be studied. We feel, however, that we have demonstrated a great increase in virulence in this culture obtained from sputum by the several passages through calves.

Our own experiments, as well as those quoted from others, demonstrate that Koch's statement that human tuberculosis cannot be transmitted to cattle is erroneous and untenable.

*The details of this experiment, with the post-mortem findings, are contained in the Transactions of the Society; also in *Universal Medical Bulletin* for May, 1902.

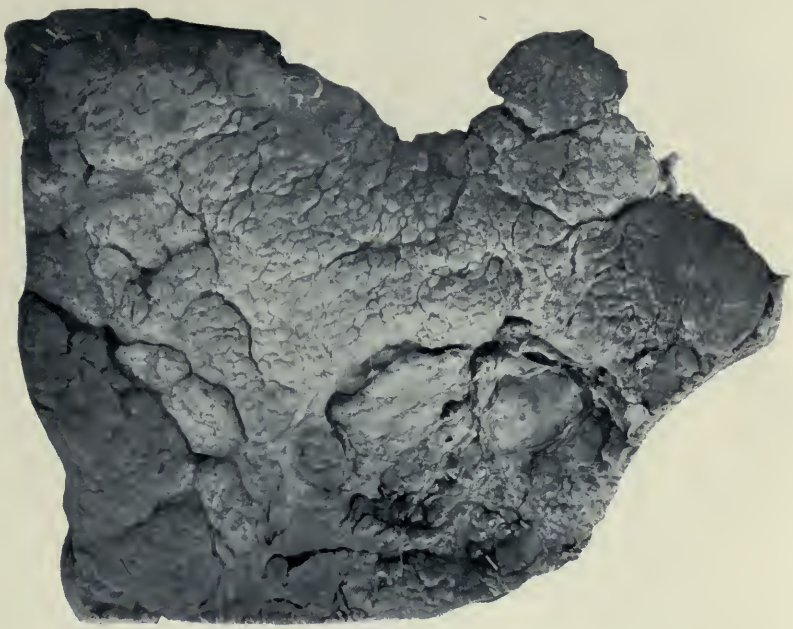

FIG. 4.—Calf A45020. Inoculated with tissues of calf 26562, which received a pure culture of human tubercle bacillus from sputum. (1) Portion of omentum showing grape formation.

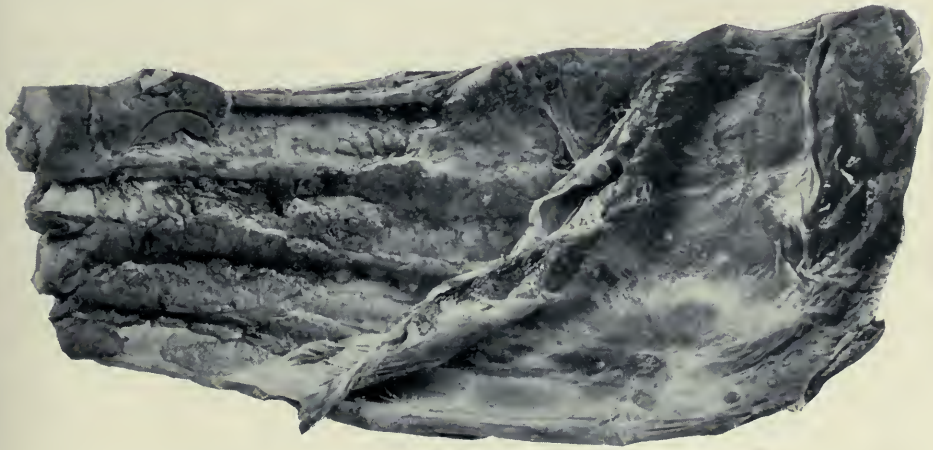

FIG. 5.—Calf A45020. (2) Portion of pleura showing grape formation.

II. In the second proposition Professor Koch calls in question the possibility of the transmission of tuberculosis from cattle to man, and holds that if such transmission ever does take place it is a very rare occurrence, so rare, indeed, as to render superfluous any measures of precaution against it.

In the solution of the problems here involved we are of necessity deprived of direct experimental data, so must gather evidence from every possible source, collate and weigh it carefully in order to draw fair conclusions.

In the first place, we may well ask if tuberculosis in cattle is marked by any specific features which differentiate it from tuberculosis in man, and which would make it improbable that the two were intercommunicable. I will not attempt here to go into a discussion of all the forms of bovine tuberculosis, or to compare it minutely with the disease in man. The chief differences are: (1) The marked tendency to calcification rather than the caseation seen in man; and (2) the formation of extensive new-growths in the serous membranes, such as the pleuræ and peritoneum.

These growths assume wart-like, or cauliflower, or grape-like shapes, from which the names "perlsucht," "pearly disease," "pommelière," and "grape disease," as applied to bovine tuberculosis, are derived.

In cattle, as in man, the lungs are the chief seat of the disease. In about half of all cases the lungs and serous membranes are simultaneously affected—the lungs alone in about one-third, and the serous membranes alone in about one-fifth.

Since 1863 Virchow[19] has insisted that the two tuberculoses were distinct, an attitude reaffirmed by him in his latest publication, his chief point being that we cannot call anything tuberculosis which does not show the true histological tubercle, whether or not the tissues contain tubercle bacilli and show changes due entirely to them. Although insisting so strongly on this distinction, which is not held by all pathologists, Virchow does not accept Koch's conclusions and says that in the post-mortem examinations at the Charité several cases have been found showing an unusual peritoneal tuberculosis, with enormous growths such as are seldom seen in man. These cases he regards as being possibly of bovine origin through food.

The histological identity of human tuberculosis and pearl disease was first demonstrated by Schüppel,[20] and his work has been supplemented by Baumgarten,[21] who has observed characteristic caseation such as occurs in the human tubercle take place in the nodules

of pearl disease, "in a typical form and with like regularity." The process is often obscured by rapid calcareous changes, which, he justly remarks, are terminal, and have nothing to do with the actual disease, and which, furthermore, are often seen in human tuberculosis. On the other hand, it has repeatedly been shown that typical miliary tuberculosis can be produced in cattle by the bovine bacillus, and as seen in the specimens before you the same result may be brought about at times by the human bacillus (see Figs. 4 and 5). In fact, experimental tuberculosis in cattle induced by inoculation with the bovine tubercle bacillus is usually of the miliary type, and only exceptionally assumes the form considered typical of the natural bovine disease. In this connection Hueppe[22] very aptly calls attention to the fact that Koch in his experiments with the bacilli of bovine tuberculosis produced in cattle "only tuberculosis, but not the tuberculosis of the pleura peculiar to the ox—the so-called perlsucht; his experiments, therefore, in the sense of his special interpretation, did not even prove that bovine tuberculosis affects the ox." It has further been shown by Troje,[23] and by Dr. Theobald Smith,[2] that pearl disease may be produced in rabbits by the human tubercle bacillus. Troje has observed one case of pearly disease affecting the pleura in man.

The differences noted between tuberculosis of man and tuberculosis of cattle are scarcely greater than those noted between the latter and tuberculosis of swine, yet nothing is easier than to infect swine with the milk or other products of tuberculous cattle. The infection here is by natural methods, and in fact is most often noted where nothing was further from the wishes or intentions of the unconscious experimenter. The origin of the infection is unquestionably bovine, yet the disease produced differs markedly, but not essentially, from that seen in cattle. The evidence then leads us to conclude that such differences as are commonly seen between human and bovine tuberculosis are in no sense essential.

Bacteriological Evidence—Morphology and Cultural Characteristics of Human and Bovine Tubercle Bacilli.—That there were certain differences to be observed in cultures of the tubercle bacillus isolated from man and from cattle was shown by Dr. Theobald Smith in 1896, who confirmed his first observations in 1898, his human cultures being almost always obtained from sputum. A study similar to Dr. Smith's has been carried on at the laboratory of the State Live-stock Sanitary Board of Pennsylvania for several years, the material for the cultures being obtained from divers sources. With one exception, which was isolated from sputum, all the human cul-

tures have been obtained from internal organs, especially the lungs and mesenteric glands. Two of the bovine cultures have been found in milk, the others coming from internal organs or glands. The result of our observations, which have agreed closely with those of Dr. Smith, is as follows: The morphology of the bacilli in cultures of bovine origin is more uniform and constant than in cultures from man. The bovine bacilli are thick, straight, and short, seldom more than 2 μ in length, and averaging less. In the early generations many individuals are seen which are oval, their length not more than double their breadth. They stain evenly and deeply with carbol-fuchsin, beading being almost always absent from young cultures and often from old ones.

The human bacilli are, as a rule, much longer from the start, and tend to increase in length at once in subcultures. They are generally more or less curved, some cultures showing S-shaped forms. They stain less intensely with carbol-fuchsin, and beading is generally seen, even in early growths.

The above characteristics are most marked and most persistent in cultures grown on blood-serum. On glycerin agar, glycerin bouillon, and glycerin potato the bacilli from the two sources approach each other in cultural features and morphology much more closely, and by continued cultivation the differences tend to become obliterated. Bovine cultures are more difficult to isolate than human, are apt to grow as discrete colonies in the first culture, and for several generations are likely to grow in an exceedingly thin layer which resembles ground glass closely. The optimum temperature as well as the thermal death-point is practically the same.

The human bacillus, as a rule, grows more easily and abundantly from the first, and will grow well on glycerin agar in subcultures made directly from the original growth on blood-serum. All attempts to obtain a like result with the bovine organisms have failed.

The morphological distinctions tend to disappear also in the tissues of susceptible animals. We may inoculate a typical bovine culture, and in a very short time scrapings from the various organs will show long and very much beaded bacilli.

The most striking dissimilarity is, however, seen in the action of the bacilli from the two sources on animals. By whatever method of inoculation, the bovine bacillus, as a rule, possesses a very much greater pathogenic power than the human bacillus for all animals on which it has been tried, the only exceptions being possibly those animals, like guinea-pigs and swine, which are so extremely suscep-

tible to both types that it is hard to draw any distinction between them. This was the case with swine inoculated by feeding in our own experiments, but Koch and Shütz found that for swine also the bovine bacillus was much more active. The list of animals for which this increased virulence has been proven includes horses, cows, asses, sheep, goats, dogs, cats, rabbits, guinea-pigs, and recently the same thing has been shown to hold true for man's relative, the monkey, by de Jong,[13] de Schweinitz and Schroeder,[24] and ourselves.

In our own experiments two monkeys inoculated subcutaneously with culture L, obtained from milk, died on the thirty-third and thirty-seventh days, respectively, while the corresponding pair of the same species, and as nearly the same weight as possible, inoculated with culture M, from human sputum, lived fifty-four and ninety-six days, respectively, the last being chloroformed in a moribund condition. Two other monkeys which were inoculated by feeding five times with the same cultures smeared on banana, lived forty-two and ninety days, respectively. The post-mortem examinations showed for the animals which received the bovine cultures a more active invasion and more acute process.

What has been said concerning the greater pathogenic power of the bovine organism has, I think, been proven beyond question to be the rule. It must be borne in mind, however, that what we speak of as virulence is a very variable quantity, no microörganism being known which always shows the same degree of pathogenicity. The tubercle bacillus isolated from cattle varies in its pathogenic power considerably, though not perhaps to such an extent as those obtained from human sources. Among the latter we find some cultures which have feeble action even on the most susceptible animals, like guinea-pigs,[25] while others are most actively virulent. Besides culture BB, described in this paper, cultures of exalted virulence have been isolated from man by Vagades[26] and Lartigau.[27] Whether or not these cultures were in reality the bovine organism which had infected man we cannot say now. At present our knowledge is so restricted in the matter of differentiation that we must designate the cultures human or bovine according as they are isolated from man or from cattle. The dictum of Koch that inoculation of cattle will infallibly distinguish one from the other cannot be accepted off-hand, as it is far from proven that virulence for cattle is a fixed and constant characteristic. Professor McFadyean[28] says: "If a low degree of virulence for cattle is to be taken as the distinguishing feature of human bacilli, there will be no difficulty in proving that the human disease is sometimes transmitted to the lower animals."

Has the bovine tubercle bacillus more pathogenic power for man than the human bacillus? In trying to interpret the results obtained by inoculation of animals we are forced to ask ourselves whether or not they are applicable to man also. Having proven that for practically all experimental animals the bovine tubercle bacillus possesses, as a rule, a much greater pathogenic activity than the human, is it fair to conclude that this increase of virulence will hold good for man also? Until the contrary is proven, or until good reason for believing the contrary is shown, I feel that this must be our conclusion. This matter opens up a most fascinating field for speculation, in which we meet with many apparent contradictions; and until we gain a better understanding of immunity in general we cannot speak dogmatically, but must stick to ascertained facts in each individual case. Virulence is a factor which is relative to the subject, and exaltation of virulence for one species of animal does not necessarily prove an increased power for other species. Indeed, the reverse is sometimes true. For example, the streptococcus is said to become increased in virulence for mice by successive passages through these animals, but less virulent for rabbits. So, too, the bacillus of "rouget du porc," though but slightly pathogenic for rabbits, rapidly acquires a high degree of virulence for them by successive passages; but when this has taken place we find that all virulence for swine, from which it came in the first place, has disappeared. Large doses do not even make them ill.

Admitting freely all these facts, we must regard them as exceptional, for it is a firmly established rule in bacteriology that when the virulence of a pathogenic organism is increased for one animal it is increased for all that are naturally susceptible to its action, as well as for those in which the disease is known only experimentally.

That as regards man a result analogous to that seen in the streptococcus, or the bacillus of "rouget du porc," has not taken place by the residence of the tubercle bacillus in the tissues of cattle is proven by the cases of accidental inoculation of man with the bovine bacillus as well as by the cases observed clinically in which tuberculosis has followed the consumption of tuberculous milk. The tubercle bacillus is unique in the extent of its pathogenic activity, both by direct experimental inoculation as well as by infection under what may be considered more or less natural conditions. The list of animals in which tuberculosis occurs in parks and zoölogical gardens is appalling, the discoveries of Dubard[29] and others showing that not even the cold-blooded animals are exempt from this universal scourge. While it may be said of the tubercle bacillus that in

cultures in the laboratory it is unusually tenacious of its characteristics, it is certain that in nature it has a wide range of adaptability as a pathogenic agent. Hence, for the tubercle bacillus, perhaps more than for any other known microbe, we are justified in believing that an exaltation of virulence for practically all experimental animals will hold good in the case of man also.

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(*To be continued.*)

WHAT SHALL WE TEACH THE PEOPLE IN REGARD TO TUBERCULOSIS?[1]

BY GEORGE W. WEBSTER, M.D.,
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The State Board of Health is charged with the duty of guarding the lives and health of the citizens of the State. It is its duty therefore to seek out and apply the best that is known in public hygiene and sanitary methods. But the best work cannot be done by the board alone, but can be accomplished by the aid, coöperation, and support of the people, and this can be secured only after they have become well informed upon sanitary subjects.

It therefore becomes our duty to answer the question, "What shall we teach them in regard to tuberculosis?" What shall we teach the five millions of people of our State in regard to the most important disease which affects them, and their duty in regard to it? Much good has, we believe, been accomplished by the board in sending out circulars of information in regard to smallpox, scarlet fever, and diphtheria, and we believe much more can be done by sending out a similar circular in regard to consumption.

The following paper contains the essentials of a circular which I am preparing for distribution, and I invite your criticism of both the method and the matter:

MODE OF DISTRIBUTION OF LEAFLETS.

1. To the newspapers as the educators of the public.
2. To local boards of health.
3. To teachers and principals of schools.
4. To all physicians in the State.
5. To families and friends of families where tuberculosis is known to exist.
6. To any one making application.

Our efforts should be directed in behalf of the patients whom we desire to help and the public whom we desire to protect, and our instructions should be simple and practical rather than scientific, but above all things we should teach the truth.

Tuberculosis or consumption is an infectious, preventable, curable disease.

Prevalence.—1,500,000 human beings in the United States have

[1] Read at the meeting of the Illinois State Medical Society, May 21, 1902.

the disease; 2,500,000 cows in the United States have the same. The studies of Behring seem to refute the statements of Koch and support the contention that human and bovine tuberculosis are identical, with the exception of slight morphological modifications due to environment.

Cause.—The disease is caused by the tubercle bacillus. The chief source of these germs is the sputum of consumptive patients. It is estimated that a case of moderate severity expectorates seven billions of these germs every twenty-four hours.

These germs are given off from the lungs with the sputum, which is hawked or coughed up, cast upon the sidewalks or the street, upon floors or carpets or public places, or upon the clothing. The sputum becomes dried up, mingles with the air and dust of the home or the street, from whence the germs may be breathed into the lungs, thus becoming a source of infection. They are very tenacious of life, resisting ordinary destructive processes for months. They may be eaten by flies, live in their bodies, and may be deposited by them upon food, as meat and milk. They may be found on the floors, walls, etc., of the rooms of consumptives. Thus the man who is able to do some work and goes about, spitting on the street, in the street-cars, on the floors of the home, the workshop, or public places, is a far greater menace to the lives of others than is the seriously ill patient, at home in bed.

Modes of Communication.—When we say that it is an infectious disease this means that it may be communicated from one person to another, and probably from man to the lower animals, and from the latter to man. It is not necessary to have personal contact in order to become infected. The paths by which these germs enter the body are the respiratory and the digestive tracts chiefly; but they may enter through an abrasion of the skin of the hands or face or other part of the body. That is, the germs are either inhaled with the air, or swallowed with the food and drink, or gain entrance through some wound or sore upon the body.

Heredity.—From the remotest times there has been a general belief in the influence of heredity in disease, and especially consumption. Owing to a clearer knowledge of pathology, many of the diseases which were formerly thought to be the outcome of hereditary proclivity are now known to be due to infection. Some diseases are directly transmissible, and in addition to this there is an inheritance of structural peculiarities. In tuberculosis we have an example of the inheritance of both tissue modification and the disease itself—that is, the form of chest and type of tissue in which the

disease develops most readily is certainly inherited. But what is inherited is not alone a tendency to tuberculosis, but an increased vulnerability to adverse conditions of all kinds. Such persons fall easy victims to tuberculosis, not because they have inherited the disease, but because they have inherited the kind of soil or tissue in which the disease develops most readily. Add to this that in such families there are usually some cases of consumption, we have those persons who are especially prone to the disease placed in the most favorable circumstances for becoming infected. Most of those cases in which the disease itself is inherited die before the end of the first year. No case of tuberculosis in adult life is a case of inherited disease; it is always an infection. Some persons seem to possess unusual resisting power, are not easily infected, and this is known as immunity. Susceptibility varies in different individuals and families as the result of hereditary differences, just as protection or immunity does. Both may be varied by diet, habits, and mode of life. Thus the normal resisting power, immunity, may be diminished or even destroyed by overwork, worry, fatigue, great anxiety, bad habits, excesses, intemperance, and extreme exposure. Thus rats which are naturally immune may be readily infected after being overworked and fatigued, or after being kept under the influence of alcohol for some time.

On the other hand, children born of tuberculous parents, if removed from the likelihood of infection and properly reared, are likely to remain free from the disease. For example, over 15 per cent of the cows of Germany are tuberculous, and yet only one calf in every one hundred thousand is born tuberculous. Those calves born of tuberculous mothers and taken away from them and fed on pure milk do not contract the disease. If healthy calves are fed upon the milk of tuberculous cows they become infected.

We thus see that there are three principal factors in the problem:

1. The germ, the bacillus of tuberculosis.
2. A varying susceptibility to infection by it.
3. Two principal routes through which the germ enters the body —the respiratory and the digestive tracts.

To ignore any one of these factors is to fail in its solution; to recognize all three and the influence of each, as well as our limitations in regard to each, will be likely to lead to the best results. Let us consider each in detail.

RULES FOR THOSE WHO HAVE THE DISEASE.

The Germ.—It must be apparent that the destruction of all the tubercle bacilli would put an end to the disease, but desirable as this is, it is quite impossible. Our efforts must be directed toward reducing them to a minimum. The first rules should be in regard to the disposal of the human sputum, as this is the chief source of the bacilli and hence the chief element in infection.

Rule 1: Tuberculous patients should never under any circumstances expectorate upon the floors of the home, the workshop, or public place, where the germ may subsequently be a menace to others. To do so is criminal negligence. Every tuberculous patient owes it to his family, friends, and society to see to it that he disposes of his own sputum. Thirty-eight States recognize this fact by law. The handkerchief should not be used, as it may contaminate towels, napkins, and wearing apparel of others. Old pieces of cloth, pieces of gauze, or cheese-cloth may be carried in small pieces, and after use may be burned at once, or else placed in envelopes, preferably paraffined, and subsequently burned. If cuspidors are used, they should always contain as a disinfectant Standard Solution No. 1.[1]

Rule 2: First of all, remember that consumption is a curable disease, and that one-half of those who have it recover from it.

Rule 3: There is no other disease in which so much depends upon the individual efforts of the patient. It is not so much a matter of medicine as of correct living, proper food, climate, exercise, sleep, and hygienic living.

Rule 4: While your first duty is to yourself, for "charity begins at home," your second is no less clear and imperative: you must not menace the health and lives of others.

Every person suffering from consumption suffers from a disease which may be communicated to others. This takes place through the spit, which contains bacilli. So long as the spit is moist it can do no harm, unless under such circumstances as are dealt with in rules 6 and 7.

[1] STANDARD DISINFECTANT No. 1.—Dissolve chloride of lime of the best quality in water, in the proportion of six ounces to the gallon. Use one quart of this solution for each discharge from a patient suffering from any contagious or infectious disease. Mix well and leave in the vessel for an hour or more before throwing into privy vault or water-closet. The same for vomited matter. For a very copious discharge, especially in cholera, use a larger quantity; and for solid or semisolid matter, use the solution in double strength. Discharges from the mouth and throat should be received in a cup half full of the solution, and those from the nostrils upon soft cotton or linen rags which should be immediately burned. The chloride of lime must be of the best quality; poor chloride of lime is worthless. The solution should be made when required. Instead of chloride of lime, carbolic acid may be used in the strength of six and one-half ounces to the gallon of water, but discharges should be exposed to the action of this disinfectant for three or four hours.

The spit is gravely dangerous only when allowed to dry, becoming dust, and so infects the air we breathe.

The surest way to form infectious dust is to spit in a handkerchief and put it into the pocket or beneath the pillow, or to spit upon the floor.

The same results follow if spit is smeared over bedclothes, nightdresses, etc., or, in case of men, over mustache or beard.

Practically, then, a case of consumption may be made perfectly harmless by preventing the spit from becoming dust.

1. Indoors: The greatest care is necessary. Dust in closed places is the dust which infects. Use a spittoon containing a little water (not sand or sawdust), or spit into a rag or piece of paper, to be burned at once or thrown into the water-closet.

2. Out-of-doors: Dust is not so readily formed in our damp climate, and it is disinfected by sunshine and fresh air. It is therefore better to spit on the ground than into a handkerchief, or into anything which is apt to be put into a pocket, except a special spit bottle, such as may be had for a small sum. Failing this, spit into a gutter, never on the pavement, and never in a tramcar, bus, cab, or railway carriage. Never swallow the spit; it may infect the bowels.

3. If a handkerchief or other article is soiled with tuberculous spit, keep it wet until it can be washed or boiled.

4. Empty the contents of the spittoon down the water-closet, and clean the spittoon with boiling water. A little carbolic acid will kill the flies; these carry off the infective matter.

5. In cleaning rooms occupied by consumptives, capture the dust with damp dusters and tea-leaves, or damp sawdust used in sweeping. Do not chase it about or stir it up. Boil the dusters; burn the sawdust and tea-leaves.

6. No spoon, cup, or other article which has been applied to the mouth of a consumptive ought to be used by a healthy person until it has been carefully washed. The remains of food left by a consumptive ought not to be used by the healthy.

7. No consumptive ought to kiss or be kissed, except on the cheek or brow.

8. No consumptive mother should give such kisses.

9. Consumptive persons ought to have a bed by themselves.

10. Consumption is not communicable by the breath or perspiration. If these precautions are attended to there is no danger to the healthy in the ordinary intercourse of family or society.

During the currency of cases of tuberculous disease in which

there is a discharge, the medical officers will give any assistance in the way of washing and disinfection which may seem expedient in the public interest.

Tuberculous patients should not be allowed to work at

(*a*) The care of cattle, especially cows.

(*b*) The preparation of foods, as dairy-maids, cooks, bakers, milk dealers, etc.

Hygiene.—Let us now consider the second element in our problem, susceptibility to infection. As we cannot destroy all the germs, our hope lies in doing everything which will enable the body to contend most successfully against invasion by disease; to prevent it if possible, and to fight it successfully after infection has taken place. There is truth in the old adage, here as elsewhere, that "an ounce of prevention is worth a pound of cure." Preventive medicine is dominated by the noblest motive that ever animated the human race.

GENERAL RULES FOR THOSE WHO ARE PREDISPOSED.

1. First of all is the law and the gospel of cleanliness. This means personal cleanliness in regard to the body, the teeth, the hair, and the nails. Cleanliness of the home, the streets, cleanliness everywhere.

2. Temperance in all things. Alcoholism is the most potent factor in the propagation of tuberculosis to-day. It not only predisposes to infection, but regular indulgence greatly increases the virulence of the infection and hastens a fatal termination.

3. Eat an abundance of properly cooked, wholesome, easily digestible, nutritious foods. Be especially careful to avoid excesses in sweets or anything which will favor the occurrence of acid dyspepsia.

4. Live as much as possible out-of-doors and in the sunshine. Choose such work as will favor this, and avoid sedentary occupations and the professions. It is better to be "a live farmer than a dead doctor."

5. Choose such exercises as will promote health and favor the expansion and development of the lungs.

6. Breathe an abundance of pure air, both day and night. To do this it may be necessary to live in the country. It is better to be alive and well in the country than dead and buried in the city.

7. The home should be so chosen as to avoid a damp situation.

8. Select a climate, if possible, with at least a moderate elevation, preferably hilly, with a maximum of sunshine, a minimum of

rainfall, and warm enough to invite to outdoor occupation, sports, or exercises.

9. Sleep in a well ventilated room with an abundance of fresh air.

10. Avoid smoking-rooms and smoking-cars and poorly ventilated public assembly-rooms.

11. Change of climate in order to avoid the extremes of cold in the northern winter, or the heat of the southern summer.

12. Be especially careful to not live with consumptives, to not occupy premises formerly occupied by a consumptive unless such premises have been disinfected with great care and by sulphur fumigation.

13. Never eat suspected meat nor drink suspected milk.

14. The clothing should be of wool next to the skin in winter, and warm shoes should be worn and every precaution taken to prevent taking cold.

15. Avoid mouth-breathing. When there is any impediment to free nasal respiration in either the nose or throat, a competent physician should be consulted.

16. Give especial care to any pulmonary symptoms.

17. Above all things avoid everything which lowers the vitality and diminishes the resisting power, such as overwork, too little of long vacations, exhaustion from overwork or exercise, exposure.

18. Remember that you *have not inherited consumption*, but only a weak constitution, and that in no other disease does so much depend upon yourself and your own efforts.

19. Do not marry a consumptive, nor one who is predisposed to the disease.

20. Fifteen per cent of the cows of the United States are tuberculous and may be a twofold source of infection—through the meat and the milk. Therefore, in all suspected cases, the meat should be well cooked and the milk thoroughly boiled. Merely heating it or bringing it to the boiling point is not enough. It should be boiled for twenty minutes.

21. *There is no danger in living with tuberculous patients, so long as these rules are rigidly observed.* In the Adirondack Cottage Sanitarium, devoted exclusively to the care of tuberculous patients, there has not been a case of tuberculosis among the physicians, nurses, or attendants in fifteen years.

DISINFECTION.

All rooms occupied by consumptives should be kept scrupulously clean. Unnecessary draperies, carpets, etc., should be dispensed

with. If sputum or other discharges accidentally fall on the floor or walls, the spot should be cleaned immediately with boiling water. The rooms and all the furnishings should be thoroughly disinfected as often as every four weeks at most.

1. The Breslau formaldehyde method or the use of sulphur are the methods recommended. The sheet process is unreliable.

2. All premises or rooms, sleeping-car or steamer berths, occupied by a consumptive in a home, hotel, boat, car, or hospital, should be as thoroughly disinfected before it is occupied by another as it would be in the case of smallpox. This should not be attempted by any one except some person properly qualified.

3. All personal clothing, bed linen, handkerchiefs, etc., belonging to a consumptive should be washed by themselves and very thoroughly boiled.

4. All dishes, spoons, knives and forks, etc., used by him should be thoroughly washed and boiled before being used by others.

NOTIFICATION.

All persons affected with consumption are urgently requested to notify either the local health authorities or the State Board of Health. It should be distinctly understood at the outset that there is no disposition or desire on the part of the board to placard or quarantine the premises, or in any way to interfere with or curtail the rights of any one. The only objects are to try to be of some service in curing those who are sick and preventing the disease in those who are well; to furnish information and help to those who are vitally interested.

Dr. Herman M. Biggs, of the Department of Health of New York, at a recent meeting of the New York County Medical Society, stated that as the result of twelve years of work and experience there had been a reduction of over 35 per cent in the mortality from consumption in New York since 1886, and *attributes it largely to notification.* Some States have compulsory notification. Voluntary notification is far preferable.

CONCLUSIONS.

The man who expectorates in a vehicle or public resort does not merely violate public decency, but commits an offense for which he should be punished. Health board warnings and placards in street-cars avail nothing if not enforced. So long as women sweep infected sputa with their dresses they will suffer from tubercular disease and communicate it; so long as the dust of dried sputa is disseminated

and inhaled in public vehicles every passenger is endangered. Men and women, especially women, are urged to form associations for the rigorous suppression of indiscriminate spitting, and boards of health will do better service to the community if they direct their best efforts toward the prevention of tuberculosis. The segregation of those already afflicted in local sanatoria, as advocated at the Berlin Congress, will ultimately check the progress of this frightful scourge and add immensely to the sum total of human happiness.

It is a curable disease. Autopsies show that one-third of all persons have had some form of tuberculosis at some time in their lives, while only one-seventh die of the disease. In other words, one-third, or twenty-three millions out of the seventy millions now living in the United States, will have the disease, and only one-seventh, or ten millions, will die. The other thirteen millions will get well. We thus see that over one-half of all cases recover. This is amply confirmed by the clinical experience of all observant physicians.

Gradual, progressive loss in weight should make you suspicious and should lead to an expert examination of the lungs. This is especially true, if in addition to loss in weight there is increased frequency of the heart-beat, with a slight fever in the afternoon that is increased by exercise.

THE STOKES-ADAMS SYNDROME, WITH REPORT OF TWO CASES.

BY FRANK BILLINGS, M.D., CHICAGO.

The Stokes-Adams syndrome or disease was first discovered by Adams, and later studied more fully by Smith and Stokes. Huchard made an exhaustive study of the condition at a later date and proposed the association of the names of Adams and Stokes with it.

The phenomena which characterize the disease consist of a permanent slow pulse with attacks of giddiness or faintness, or transient unconsciousness, or of epileptiform convulsive seizures.

Attending these characteristic symptoms is usually a subjective breathlessness or a dyspnea, and the patient is often pale, especially just before an attack of unconsciousness.

Besides these phenomena there may attend as symptoms or signs any of the phenomena usually associated with cardiac and blood-vessel disease, viz., various degrees of angina pectoris, Cheyne-Stokes' phenomenon, cardiac asthma, and at some time in the course of the disease may occur more permanent signs of cardiac failure in the way of venous congestion of lungs or of abdominal organs, with dropsy.

The pulse is characterized by the fact that in a classic case it is slow, ranging anywhere from five per minute, as in Halberton's case, to fifty. Usually each arterial pulse is distinct and quick and regular, although there may be an associated irregularity which is hard to detect if the pulsations per minute be few. In listening over the heart the chief characteristic is the great length between the second and first tones of the heart. In some cases there may be an incomplete contraction of the ventricles, not sufficient to send the blood wave, as a perceptible pulse, to the wrist. Aside from the above characteristic phenomena of the heart action and radial pulse, there is nothing present which may not be found in the various cardiac diseases. It may be said, however, that these phenomena are not common in valvular disease, and when murmurs are present they are more frequently due to relative valvular insufficiency than to disease of the leaflets.

The attacks of syncope vary in intensity from a slight giddiness to complete unconsciousness, with or without convulsions. The syncopal attacks may be repeated many times, and the patient usually dies in one. The following cases present the syndrome in a classic way:

Case 1.—Male, aged 46, white, born in the United States, a

teamster by occupation, came to me about the middle of February, 1902. His family history was unimportant. He denied venereal disease. He drank four or five glasses of whiskey daily, and sometimes used beer. He smoked a pipe excessively. He had jaundice at 31, which lasted eight weeks, but does not remember being sick at any other time.

As a teamster he was obliged to lift heavy pieces of merchandise, and seven months ago, while lifting a heavy weight, he felt a sharp pain in the left chest in the region of the nipple. At the same time he had a feeling of suffocation, and coughed, but did not expectorate blood. For the next few days exercise produced pain in the region of the heart and shortness of breath, and he was obliged to remain quiet. After eight weeks he returned to work, at which he continued until seven weeks ago, at which time, when beginning work one morning, he fell to the ground unconscious. He was told that he did not have convulsive movements of the extremities, and that his unconsciousness lasted but a minute. He was able to get up and go about his work. Since that time he has fallen unconscious five times, but has had no convulsive movements so far as he can learn from his friends. He has not bitten the tongue, nor has there been a froth about the mouth when he has recovered consciousness. There has been no involuntary discharge of the bladder or bowel during the seizures.

Since the beginning of his illness, seven months ago, he has had shortness of breath upon exertion, and when overexerting has felt uncomfortable from dyspnea, and has cough. There has been no difficulty in swallowing, and there has been no disturbance of the digestive tract excepting slight constipation. He has lost twenty-five pounds during the last seven months.

On examination the patient appeared fairly well nourished and of good color. His radial pulse was 40 to the minute and regular when sitting, the respirations were 18 per minute, and the temperature was 98° F. It was noticed that the right pupil was dilated and fixed, but this condition the patient explained had occurred in childhood from an injury, and it probably, therefore, had nothing to do with his present condition. The heart dulness extended one inch to the left of the left nipple, the right border to one inch beyond the right border of the sternum, and the upper border dulness extended upward and to the right from the third rib to the first interspace on the right side. This area of dulness was easily mapped out and appeared to cover the area of the ascending arch of the aorta and to extend slightly above and to the right of the sternum. The apex

beat could not be seen, but could be located in the fifth interspace in the nipple line. A diastolic roughness, not a murmur, could be heard at the second right interspace. While under observation at a later date, a systolic murmur could at times be heard in the mitral area, and the second aortic sound was sometimes accentuated.

The lungs showed nothing important. The liver was palpable below the costal arch, but was not indurated nor tender. The spleen was not palpable. There was no tracheal tug. There was no laryngeal paralysis, and there was no throbbing or thrill to be felt over the upper chest in the region of the abnormal area of dulness.

A sphygmogram showed a normal tracing as to individual beats and time of each complete systole; the diastole was very much prolonged. A skiagram showed a shadow in the region of the abnormal dull area.

A twenty-four-hour collection of urine amounted to 950 cubic centimeters, the specific gravity 1.021, acid reaction, no albumin, no sugar, no casts, no blood. Total solids for twenty-four hours was 46 grammes, the urea 2.3 per cent, or about 22 grammes in twenty-four hours.

The patient was admitted to the Presbyterian Hospital on February 19 and remained there under observation until the 18th of March. While in the hospital his highest pulse, observed at one time, was 60. Usually his pulse was below 40, sometimes reaching as high as 48. The lowest pulse recorded was 32. His morning temperature in the mouth was usually 97°, and the evening temperature rarely above 98°. The respirations were regular and ranged from 14 to 18. The bowels were usually constipated and required a laxative.

Many examinations of this patient were made, and the findings as noticed were confirmed. A diagnosis of aneurism of the arch of the aorta was made attended with the Stokes-Adams syndrome. While in the hospital the patient had no syncopal attacks, and when seen last, on the 10th of April, he had had no attacks of unconsciousness. With rest in bed and the systematic care in the hospital he had subjectively improved, and no longer had shortness of breath, nor dizziness, and he felt so well that he finally requested to be allowed to go to work again. His treatment consisted of rest and a simple fixed diet, with five- to ten-grain doses of the iodide of sodium three times a day.

Case 2.—Man, aged 59, white, born in Holland, a laborer, was admitted to the Presbyterian Hospital on February 19, 1902, in the service of Dr. J. B. Herrick, who was kind enough to allow me to report the case.

The father died of tuberculosis at the age of 42. One sister and one brother also died of the disease. The mother is still living at 84, and one brother is well at the age of 66. The patient says he had measles in childhood, but does not remember any other illness until fourteen months ago. He denies venereal disease. He has used beer in moderate quantities, and has smoked steadily for years.

The patient says that fourteen months ago, while sitting, he suddenly fell over unconscious. He does not remember whether he had a convulsive seizure or not, but when he regained consciousness there was a sharp pain in the right side of the head which continued for about six weeks. He was unable to go about, although he says that he could use all of his muscles well. Following this he had many attacks of dizziness, which came on suddenly, in which he would lose consciousness but would not fall. About one year ago he had an attack of severe pain in the region of the heart attended with a sense of constriction and shortness of breath. There was some cough, and he says that he expectorated some blood. His bowels have been constipated, but there has been no other disturbance of the digestive tract.

On examination the patient appeared to be about 60 years of age, well developed, and fairly well nourished. The chest was large and somewhat barrel-shaped. The lungs were hyperresonant. The respiratory murmur was clear, but of the emphysematous type. The upper border of heart dulness was at the third rib; it extended to the nipple line on the left and to the right sternal border on the right. The heart tones were clear but very faint, and the heart action was unsteady. The systole was not always complete, and some blood waves did not reach the radial artery as a perceptible pulse. Counting the heart-beats with the stethoscope, it varied from 40 to 56 per minute, while the radial pulse ranged from 30 to 50. There were no cardiac murmurs. The abdominal organs were negative.

The urine was scant, the twenty-four-hour collection amounting to 350 cubic centimeters, specific gravity 1.020, urea 1.7 per cent or 6 grammes in twenty-four hours, and the total solids 16.5 grammes. A later collection gave 1100 cubic centimeters in twenty-four hours, with an improvement in the total urea and total solids excreted. The palpable arteries were everywhere thickened and tortuous, and there was an arcus senilis.

He remained in the hospital until the 1st of April, and while under observation presented practically the findings above named. His pulse was often irregular, sometimes perfectly regular, and

usually slow, ranging from 40 to 50 beats per minute. The temperature was often 97° in the morning, and rarely above 98° in the evening; the respirations ranging from 16 to 20. He had many giddy attacks while in the hospital, in which, while sitting, he would momentarily lose consciousness. He improved steadily, however, and during the latter part of his stay in the hospital had no attacks, and the pulse improved as to its regularity, although it remained slow.

Repeated examinations and observations of over a month seemed to justify the diagnosis of fibrous myocarditis with associated senile arteriosclerosis and the Stokes-Adams syndrome.

I have quoted these two cases rather fully for the purpose of demonstrating two entirely different pathologic conditions as to the cardiovascular system, with practically the same symptom-complex, although the first case presented the phenomena of Stokes-Adams more typically than the second.

Dr. D. W. Prentice, of Washington (Transactions of the Association of American Physicians, 1889 and 1890), quoted and reported ninety-six cases in which he, after analysis, concluded that the slow pulse may be produced by disease from injury of the pneumogastric or sympathetic nerves or their centers, or of the cardiac ganglia, or of the heart muscle.

Balfour, quoted by Gibson (Diseases of the Heart and Aorta, 1898), thinks a slow pulse is not due necessarily to any cardiac lesion but to cervical inhibition acting through the accessory nerve. Huchard, quoted by the same author, thinks the majority of cases are due to sclerosis of the coronary arteries and to bulbar ischemia.

In cases reported by Robert T. Edes, of Boston (*American Medicine*, May 18, 1901, p. 299), a case is reported with autopsy which showed the coronary arteries normal, the myocardium normal, atheromatous plaques at the beginning of the thoracic aorta, and with normal arteries at the base of the brain. In 1891 Dr. Edes reported an autopsy upon a case of Dr. Prentice, of Washington (Transactions Association of Physicians, 1891, p. 259), a man of 53 with a pulse ranging from 11 to 40 per minute, who for two years had had frequent attacks of syncope. Clinically no disease of the heart or other organs could be discovered. During the last two months he had frequent dizzy and syncopal attacks, and for several days before his death was delirious. He died suddenly. The heart muscle appeared normal. The aorta and the coronary arteries were not atheromatous. Brain, cord, and medulla appeared normal. The terminal twigs of the pneumogastric showed fusiform enlargements

at the point of separation of the cardiac branches from the recurrent laryngeal, and appeared to show a connective tissue increase. Other nerves, including the cardiac plexuses and the ganglionic cells, were normal. No intrinsic cardiac ganglia were found. The few changes found in this case were not considered necessarily pathologic.

We have, therefore, no pathological anatomy in these cases which is constant, and the syndrome must be considered simply as clinical phenomena occurring in different pathological conditions.

It is agreed that the dizziness and syncopal attacks are probably due to the lessened blood-supply to the brain. This is evinced by either continued pallor of the face or by pallor preceding the attacks. That there may be an associated vasomotor spasm as occurs in epilepsy is admitted. The slowness of the pulse is a phenomenon which may occur in many different conditions. As Regal has shown, it may be physiologic as it appears in the puerperal state, falling to from 34 to 26 per minute. Its explanation here is not clear. The radial pulse may be slow as a family trait. Napoleon is said to have had a pulse of only 40 to the minute, and many other cases equally slow have been recorded in which there was no evidence of disease. Pathological bradycardia may occur in exhausted states like that which follows the acute infections, notably typhoid fever, diphtheria, pneumonia, rheumatism, gastrointestinal disease, and also in exhaustion from overwork. It may occur in diseases of the heart and blood-vessels, and usually in diseases of the heart in which fatty or fibroid cardiac changes have occurred. It may occur as the result of toxemia due to tobacco, lead, alcohol, tea and coffee, digitalis, and in toxic conditions incident to uremia and gastrointestinal disorders; in diseases of the nervous system like apoplexy, cerebral tumors, epilepsy, diseases of the spinal cord and medulla; in hysteria, insanity, and paresis; and finally it may appear as the result of pain, overheating like insolation, etc.

In summing up the present knowledge of the pathology and the cause of slow pulse, Dr. Edes (*loc. cit.*) comes to the following conclusions:

A permanent slow pulse depends upon weakness or paresis of the augmentor or accelerator system. This may take place in any portion of its course; in some very marked cases it is the result of injury to the cervical spinal cord. In the majority of medical cases it is supposed to be connected with degeneration of the cardiac ganglia, but evidence of this is, as yet, more physiological and clinical than anatomic. It is decidedly a symptom indicating weakening of the heart. The paroxysms are the consequence of reflex excitation

of the vagus, which may be no more than normal, acting against an antagonist while weakened by degenerative changes.

The diagnosis of the case when typical is easy, as the characteristic slow pulse with the syncopal attacks is pathognomonic. It must be remembered, however, that a radial pulse is not always the index of the heart pulsation. A weakened systole may not send a wave sufficiently forceful to be felt at the wrist, and the radial pulse of 36 may represent a heart action of 72. Furthermore, epilepsy may be associated with slow pulse, and it would take close observation over a considerable period of time to enable one to say it was not the Stokes-Adams syndrome. The diagnosis would be easily confirmed by observation over a considerable period, as the pulse is permanently slow and the disease progressive, so that the patient is apt to have an increasing number of syncopal attacks.

The prognosis is uncertain and depends of course entirely upon the basic cardiovascular disease. There are records of cases extending over many years. Osler reports the history of one patient who was known to have a slow pulse for thirty years. As the disease commonly occurs, however, in relatively old people (Adams's case first reported was 68, and Stokes's two cases were 56 and 68 respectively), and as the disease is usually associated with grave degenerative cardiac disease and therefore progressive, the end may come suddenly in a syncopal attack at any time.

The treatment should be based upon the cardiovascular condition. The nitrites and iodides frequently give relief to the syncopal attacks. Digitalis has been known to quicken instead of slow the heart. French writers have advocated the use of a milk diet, and have reported marked improvement in the cases so treated. During the paroxysm the nitrites with diffusible stimulants are the most beneficial.

FEIGNING OF INSANITY BY A TRAUMATIC LUNATIC FOR PERSONAL DAMAGE REASONS.

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Forensic psychiatry and neurology, despite the scientific trend of the rules of evidence of the common law, but too frequently are regarded as detectives of the State in criminal cases, or of corporations in personal damage suits. Intelligent motives, memory of events of the remote past, variability of delusional acts from ordinary human causes, premeditation and skill in violation of law, concealment of such violation, flight from the immediate consequences of law violation, simulation of insanity, accomplices, confession of crime and admission of fraud, are very generally regarded as proofs of sanity. The question raised in forensic neurology or psychiatry is generally not whether a thing be a fact, but whether it have consequences supposed to be dangerous to society. This bias, foreign alike to science and the spirit of the common law, exerts too often an influence on forensic neurology and psychiatry. The subject is not approached from a scientific standpoint, but from an *a priori* society and property protection basis, the source of all mob law and tyranny.

The status of the common law on the subject was well stated by the Wisconsin Supreme Court[1] nearly a decade ago, which decided: "That instructions to the jury upon the trial of the issue of insanity —that if the defendant at the time of the killing was sufficiently sane to deliberate and premeditate a design to effect death, he was sane within the spirit and meaning of the law, although he may have been in truth subject to insane delusions on other subjects, and that if he had sufficient power of mind to deliberate and premeditate a design to effect death you should find him sane—unexplained, are clearly erroneous, as they set up as an absolute test of sanity the power to deliberate, premeditate, and design. They make the presence of sufficient intelligence in the party accused, to form a design to do a criminal act, conclusive evidence that he is sane and subject to punishment if he execute such design. The presence of intelligence is by no means an absolute test of sanity, for with intelligence there may be absence of the power to determine

[1] *Northwestern Reporter*, vol. xiv.

the true nature and character of the act, its effects upon the subject, and the true responsibility of the act, a power necessary to control the impulse of the mind and prevent the execution of the thought that possesses it."

The simulation test of sanity is an old one, yet its fallacious nature was evident to laymen even in the sixteenth century. At the time Shakespeare wrote "Lear," feigning of insanity by the insane was a familiar street sight. Bethlem[1] was a contracted and penurious charity with more patients than funds. The governors were in the habit of relieving the establishment by discharging patients whose recovery was very equivocal.[2] These discharged patients, thrown upon the world without a friend, wandered about chanting wild ditties and wearing a fantastic dress to attract the notice of the charitable. Shakespeare portrays one of these "Tom o' Bedlam beggars" in "Lear." Edgar, about to feign insanity, remarks:

> Whiles I may 'scape, I will preserve myself; and am bethought
> To take the basest and most poorest shape
> That ever penury in contempt of man
> Brought near to beast; my face I grime with filth,
> Blanket my loins, elf all my hair in knots;
> And with presented nakedness out-face
> The winds and persecutions of the sky.
> The country gives me proof and precedent
> Of Bedlam beggars who, with roaring voices,
> Strike in their numbed and mortified bare arms
> Pins, wooden picks, nails, sprigs of rosemary;
> And with this horrible object from low farms,
> Poor pelting villages, sheep cotes and mills,
> Sometime with lunatic bans, sometime with prayers, enforce their charities.

The practice of self-injury in the way described has come down from the times when the insane were still regarded as inspired, like the fakirs of India and the Moslem saints. The self-torturers in the sixteenth and seventeenth centuries had sunk into lunatics, and in the nineteenth century have become criminals. The procedure of striking pins, etc., into bare arms has been practiced by accomplices of pickpockets to attract crowds as late as the present year in Chicago. "Dummy-chucking" or epilepsy-feigning for the same purposes has (as elsewhere pointed out in MEDICINE) still quite a vogue among the fingersmith (pickpocket) fraternity. Both procedures might (as they were in Shakespeare's time[3]) be practiced by persons actually insane or epileptic for interested purposes.

[1] D'Israeli: Curiosities of Literature.
[2] Bucknill: "Mad Folk of Shakespeare."
[3] Notes and Queries, 1884.

Through the logic of a discussion on simulation of insanity by the insane initiated by a paper of Dr. C. H. Hughes,[1] of St. Louis, Section X of the International Medical Congress of 1876 was led unanimously to resolve that: "It is not only not impossible for the insane to simulate insanity for any purpose in any but its gravest forms of profound general mental involvement, but they actually do simulate acts and forms of insanity, for which there exists no pathologic warrant that we can discover in the real disease affecting them."

Extensive as is the literature of simulation of insanity by the insane, as I have elsewhere shown,[2] and demonstrative as was the clinical evidence which led Section X to its resolution, still the records show comparatively few cases where insanity has been feigned by the insane for self-interest alone. In most cases insanity has been feigned to avoid the consequences of law violation. Dr. C. B. Burr,[3] of Flint, Michigan, has reported a case where a paranoiac feigned insanity to secure a pension. A case of somewhat similar type has been reported by Dr. J. H. McBride,[4] of Santa Barbara, Cal. There is, according to Arrago Tamassia,[5] an undue tendency in continental Europe to undervalue simulation as a test of sanity. A paradoxic dictum of Vingtriniers, that "he who simulates insanity if he be not insane is on the point of becoming so," has been received with the utmost deference by alienists. The change in the position of alienists on the continent of Europe in this particular compared with the persistence of the old view among judges, laymen, and certain English alienists, strikingly illustrates the influence of preconceived notions as detective functions on these last.

A case came under my observation[6] in a chronic confusional patient allowed out on parole. He had been permitted the freedom of their orchards by farmers, for whom he did chores. Occasionally he wandered out of his usual territory, took the same liberties with strangers, who resented it, whereupon the quiet man became transformed in a second into an apparently raving lunatic. A posse armed with pitchforks would then convey the "dangerous lunatic" back to the insane hospital. On one occasion my little girl, with whom the patient was a great favorite, met such a posse with this "dangerous lunatic" in charge. To their horror she ran into his

[1] Transactions International Medical Congress, 1876: Section X on Nervous and Mental Disease.

[2] *Alienist and Neurologist*, 1882.

[3] *American Journal of the Medical Sciences*, 1883.

[4] *Alienist and Neurologist*, 1884.

[5] *Alienist and Neurologist*, 1892.

[6] *Alienist and Neurologist*, 1895.

arms, scolded them for hurting him, whereupon the "dangerous," seemingly violent maniac vanished to give place to a mild-mannered, genial individual, who ran with the child on his shoulder in great glee to the insane hospital. His captors had previously to drag him every single step toward the institution. He was conveyed to Kankakee with other patients in a car. Apple venders crowded around this at one stopping place on the journey. The patient opened the window and held out a round piece of tin the size of a dime. The apple vender handed up a dime's worth of apples. When these were safe in the car the patient howled maniacally and made fearful grimaces, whereat the apple vender fled in terror. Thereupon the "raving maniac" laughed uproariously, and during the rest of the journey was in evident incoherent jubilation over the results of his stratagem.

A case in which I was called upon to testify by the firm of Waters, Johnson & Pegler presented an interesting forensic phase of the feigning of insanity by the insane for interested purposes. The plaintiff, who was driving when a trolley-car of the Chicago Electric Transit Co. struck his wagon, was thrown out, striking on the frontal region, where a gash two and a half inches long was made extending back over the left temporal region on the left side. When picked up he was unconscious. Taken home on a stretcher and put to bed, he could with difficulty be roused. He had three ribs broken on the right side. The morning after the accident he had cerebral vomiting, which according to Dr. A. L. Grimme lasted for three days. The broken ribs resulted in pleurisy with effusion. He was confined to bed for eight weeks. On recovery he had slight hemiparesis and amnesic aphasia. He became depressed, irritable, suspicious, and forgetful. On three occasions he ran away from the house without cause. On a hot summer day he was found on the prairie wrapped in an overcoat with the collar turned up. Three years after the accident I found general mental confusion, irritability and suspicion, amnesia as to most recent and some past events, with loss of memory of some words. There were vague ideas of persecution, and with these a very self-satisfied air. He was able to carry on his business as a groceryman only when watched by his wife and her brother for avoidance of errors. There was inequality of the facial folds, irregular response of the pupils to light, and hesitancy in speech. He had had one epileptiform attack with subsequent hemiparesis. The jury in the case (which was tried first before Judge Tuley) gave the plaintiff $12,000 damages. This verdict Judge Tuley set aside on the ground of the damages

being excessive. It is difficult to understand on what principle of equity $12,000 would be deemed excessive damages for chronic insanity. The amount is less than the usual accident insurance allowed for such a contingency. In another case where a verdict of $15,000 had been given against a railroad (which had rendered a boy of fifteen chronically insane) Judge Hanecy cut the verdict to $8000 on the very original ground that chronic insanity was a living death, and since the Illinois statute allowed but $5000 in the event of death, it was unjust to make the company pay so much to the boy's relatives. The fact that the boy might live for decades requiring financial support was entirely ignored by the judge.

A year subsequent to the conclusion of the trial before Judge Tuley the patient had more decided ideas of his own importance and more stupid notions of persecution. He refused to allow me to examine his chest for a long time, although there was no reason why he should refuse an examination of the fractured ribs. His speech was no longer as hesitating.

Dr. H. N. Moyer made an examination for the railroad company in my presence. The plaintiff feigned insanity after the classic manner of the feigners of the literature. He did not know the names of his children nor their age nor their size. He knew that a half-dollar was money and a quarter was money, but claimed not to know which of the two was the largest in amount or size. Shown a silver match-box he said it was also money, but on further questioning he said it was something. He grunted in answer to some queries, articulated in answer to others, and answered at length reluctantly. When Dr. Moyer made an attempt to examine the affected side he made a violent resistance. Examination of the chest proved to be impracticable. The feigning was particularly stupid and obvious. The tests adopted by Dr. Moyer were the classic ones eminently calculated to bring out simulation.

Simulators, as Dr. P. C. Knapp[1] remarks, often manifest a loss of memory which is so great as to render it practically impossible that it should be real. As a rule when an insane person can be made to respond to any questions he retains some memory of familiar facts. The simulator, however, may, as in the case reported by Bernardina,[2] claim not to be able to remember his own name, that of his father, or where he is. One of Fritsch's patients claimed that there were six months in a year and three days in the week, that four and five made six, and that three times four made five. When

[1] McLane Hamilton's Legal Medicine, vol. ii, p. 412.
[2] *Revistá Sper. di Freniatria*, vol. xix.

the insane answer questions at all they usually answer with some degree of sense. Thus if an insane person be asked his age he may not give a correct answer, but his answer would have some definite relation to the question put and not be something entirely different.

That the plaintiff was insane and feigning insanity I testified. Dr. Moyer admitted that the man might be insane, but stated that he saw no evidence of anything but feigning. Had the plaintiff been induced to exhibit the depression of his chest from the fractured ribs the insane nature of his resistance to examination would at once have been evident. The jury in the second trial gave the plaintiff $4000. The railroad company was so well satisfied with the verdict that they paid it almost immediately.

The simulation of this patient was clearly due to outside suggestion by a layman who had the classical notion of insanity-feigning. The only case resembling this which I have been able to find is one reported by Dr. Nichols,[1] where a boy feigned dementia to secure damages on account of a railroad accident. In this case the subject was sane. The simulation was of a type closely resembling that found in my case. My case once more demonstrates that simulation *per se* is not positive evidence against the existence of actual disease. In the present instance the patient, like most of the chronic insane, fails to recognize his disease, and hence is peculiarly liable to suggestion involving matters of self-interest.

[1] *Boston Medical and Surgical Journal*, April 5, 1891.

CHANCRE OF THE TONSILS.[1]

BY WILLIAM CHEATHAM, M.D., LOUISVILLE, KY.

During the past eighteen months I have seen seven cases of chancre of the tonsil. Many of the profession regard this as a rare location, though a reference to the statistics shows that it is quite common.

Bulkley in his Syphilis of the Innocent (p. 30) gives a total of 9058 extra-genital infections. The site of the chancre on the tonsil is sixth in frequency, with 307 cases, or 3.5 per cent. It was surprising to note in this table that the lid and conjunctiva held fourth place, or one-half of one per cent more than the tonsils. The tonsils and throat together are given as the site of 571 cases, which place the throat as fourth in frequency, being exceeded by the lips, breast and nipple, and fingers and hands, named in the order of their frequency. Kyle (Diseases of the Throat, p. 464) says: "Next to the genitalia, the tonsil and pharyngeal sites are perhaps the most frequent seats of the primary lesion."

The frequency with which the tonsil is involved by the syphilitic virus is probably due to the open crypts, which form an excellent nidus for the development of the syphilitic poison. Many cases of chancre of the tonsils are overlooked; they have little resemblance to those which occur upon the genitals. The tonsil is increased in size, and usually its entire structure is involved. The indurated base is not so easily made out, because of the loose structure upon which the ulcer is located. In the cases coming under my observation, there has been little or no loss of tissue; the surface is sometimes covered with mucus, which is easily wiped off, but more often with a pseudomembrane somewhat elevated.

Every case of chancre of the tonsil coming under my observation had existed for several weeks, and all the recent cases but one had the secondary symptoms. Of the seven cases, all had marked cervical and submaxillary buboes except one. Chancres of other localities were excluded. These cases were not referred in consultation, or such as were were brought to my attention because they were a matter of interest; of such I have seen five cases in the eighteen months, which with the seven under my care would make twelve cases. The statistics show that the primary sore is of short duration. One of my cases, seen February 17, had a sore throat with cervical and submaxillary enlargements since before

[1] Read before the Kentucky State Medical Society, Paducah, Ky., May, 1902.

Christmas. Kyle (*ibid.*, p. 465) says: "The skin overlying these enlarged glands is not discolored; the glands themselves are felt as firm and freely movable bodies well outlined, and there is no tendency to suppuration, though the swellings may become quite noticeable. The swelling is slow and indolent, involving the glands at the angle of the jaw and sternocleidomastoid muscle: unilateral if one tonsil alone is affected, bilateral if the chancre is double, or one on each tonsil."

One of my cases was of this character. The patient was a well developed woman who had had a sore throat for some weeks and had been treated by a New York physician for some time. She had a chancre of each tonsil with a bubo on each side of the neck, and a typical skin eruption. Dr. Windell saw this case and confirmed the diagnosis.

The case having no secondary symptoms and but little glandular enlargement, had the chancre located on the posterior surface of the tonsil, and it was unrecognized for some time. The skin symptoms came late in this case. The secondary eruption is sometimes delayed for three or four months (Bosworth: Diseases of the Throat and Nose, p. 498), especially if the eruption is papillary. Dr. Evans, of Louisville, has observed a case in a woman advanced in years, in whom the skin eruption did not appear for twelve weeks. Of the Louisville physicians, Dr. I. N. Bloom reports seven cases of chancre of the tonsil; Dr. Evans four, three of them within twelve months; Dr. Dabney four; Dr. Taylor none; Dr. Windell fifteen; Dr. Comes two.

The source of the infection in primary syphilitic disease of the tonsils is varied. Kissing, a contaminated drinking utensil, the pipe, and surgical and dental instruments may convey the infection. One of my cases stated that there were several others in the factory in which he worked with similar sore throats. They may have been secondary, and yet they were reported to have glandular enlargements similar to his.

Of the seven cases, all were adults, and one only was a woman. The diagnosis of secondary and tertiary syphilis of the throat is easy, but that of primary involvement is difficult. The history of exposure in these cases is wanting. Degenerates will deny all possibility of an exposure, but when the history of exposure can be ascertained, it is a great help in the diagnosis. A persistent sore throat with enlarged glands at the angle of the jaw along the sternocleidomastoid muscle, enlargements indolent and movable with no periadenitis and no tendency to suppurate, associated with a tonsil-

lar lesion, with or without the secondary skin eruption, must be looked upon with great suspicion. Where the tonsil is persistently inflamed, with or without the skin eruption, and associated with characteristic enlargements of the glands, this should lead to the suspicion of syphilis.

Local treatment is of little value excepting in so far as it reduces swelling and possibly prevents invasion by other germs. Constitutional treatment may be given at once or be delayed until the secondary symptoms appear. My preference is for the latter plan.

In the case of a chancre on each tonsil, six days' treatment with inunctions, the daily application of nitrate of silver and a bichloride of mercury and hydrogen dioxide gargle, rapidly cleared the throat, with the exception of a small cicatrix on each tonsil, and the glandular enlargement was reduced so it could hardly be made out.

I have seen one case of chancre of the hard palate which from its rarity deserves to be appended to this account of extra-genital chancre. It was in the center of the hard palate and had a diameter of one cubic centimeter. Bulkley mentions a case of chancre of the hard palate reported by Morgannier.

BOOK REVIEWS.

DIAGNOSIS OF SURGICAL DISEASES. By Dr. E. Albert. Translated from the Eighth German Edition, by Robert T. Frank, A.M., M.D. New York: D. Appleton & Co. 1902.

This volume deals with surgical diseases from the standpoint of diagnosis, in the same manner that physical diagnosis is treated in internal medicine. A large number of works upon the latter topic have been prepared, but comparatively few upon surgical diagnosis. This work has a unique arrangement; diseases are not grouped according to their pathology, or to their regional distribution, but according as they present similarity of symptoms which gives them a general resemblance. It is the latter which in practice renders their differentiation difficult, and it is some of these problems that the work endeavors to solve.

To illustrate the method followed in the book we will take the first chapter, which deals with the causes of abnormal positions of the head. There is a short discussion of the mechanism by which the head is maintained in a normal position, and of the method by which the head is rotated and flexed and extended. A rare case is quoted from the clinic of v. Dumreicher, in which the head had sunk forward upon the chest, due to atrophy of the muscles of the back of the neck. The local treatment of the muscles and the adjustment of a jury mast resulted in recovery. The position of the head is altered by three types of dislocation in the cervical segment of the spine: those between the head and atlas, of which there are two cases on record; a dislocation of the atlas, of which there is one indisputable case recorded; and three dislocations occurring between other cervical vertebræ. The contrast between the cervical dislocation and the indefinite symptoms caused by fracture is pointed out.

The two following chapters upon injuries to the skull and brain and their primary sequelæ, and that upon inflammatory complications following injuries to the skull, are practical statements of the difficulties attending the diagnosis in this department of surgery.

Among the other topics touched upon are: Tumors of the skull; surgical diseases of the orbit, nose, and frontal sinus; diseases of the maxillæ; diseases of the mouth and pharynx; tumors of the neck; dysphagia; stenosis of the air-passages; injuries of thorax and breast; injuries of the shoulder; inflammations and tumors in the vicinity of the shoulder-joint; dislocations and fractures at the elbow; inflammation of the elbow; injuries of the hand; remarks on the diagnosis of abdominal tumors; hernia, strangulated hernia, and conditions simulating incarceration; scrotal tumors, disturbances of micturition; diseases and injuries of the rectum, hip, knee, and ankle joints; injuries of the foot, vertebral column, and scoliosis.

The above topics indicate the character of the work, which is strikingly clinical and deals entirely with the difficulties of diagnosis. Being from the hands of a master, it is of value, as it grasps certain difficult surgical conditions in such a manner that their differentiation is facilitated; not only will it be useful to the beginner in surgery, but to those who have had a wide practical experience in surgical diseases. The translating has been well done and the work is well printed.

ATLAS AND EPITOME OF OTOLOGY. By Gustav Bruhl, M.D., with the Collaboration of Professor Dr. A. Politzer. Edited with Additions by S. Maccuen Smith, M.D. Price, $3.00. Philadelphia and London: W. B. Saunders & Co. 1902.

ATLAS AND EPITOME OF OPERATIVE SURGERY. By Dr. Otto Zuckerkandl. Edited, with Additions from the Second Enlarged German Edition, by J. Chalmers Da Costa, M.D. Price, $3.50 Philadelphia and London: W. B. Saunders & Co. 1902.

This Atlas of Otology comes as near being a good substitute for actual clinical experience as mere book-making will ever reach. There are 244 colored figures and 39 lithographic plates. In addition there are 99 illustrations in the text. The colored plates are magnificent drawings which give the normal anatomy of the ear as well as it can be portrayed on a flat surface. There are numerous sections showing the relation of the internal ear to the various accessory channels, blood-vessels, and other structures. The two figures in Plate X, which show the relation of the internal ear to the dura and the overlying convolutions of the brain, serve especially to call attention to the intimate relation of meningeal complications and ear disorders.

Nearly one-half the volume is devoted to a discussion of the physiology and anatomy of the ear, together with its diseases. Taken alone, this part forms a most excellent treatise on otology.

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The translation of Dr. Zuckerkandl's work on operative surgery will be welcomed by American readers. It is from the hand of a master of surgical technique. In the work the operations of modern surgery are lucidly and tersely described. It contains 40 colored plates and 217 illustrations in the text.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of G. P. Head, M.D. Vol. IV: Gynecology. Edited by E. C. Dudley, M.D., with the Collaboration of William Healy, M.D. Chicago: The Year-book Publishers. March, 1902.

This summary of gynecology covers the past eighteen months. It is an abstract of the current literature, in which there are a few editorial comments. In the introduction we are told that the recent literature shows progress in the application of scientific gynecology to sociologic problems. The differentiation of specific infections, the critical study of statistics as related to infections, neoplasms and displacements, and a careful balance of the relative indications for gynecological operations, are discussed. The first thirty-five pages of the volume are devoted to sociological considerations and general diagnosis and treatment. Among the important topics discussed is occupation as related to the health of women, sterility of marriageable women, and the gynecological treatment of insanity. The statistics of Hobbs, who has associated gynecological surgery with the ordinary treatment of insanity, show an increase of 35 per cent in the discharge rate of women from the asylum, the average discharge rate of men remaining about the same.

The work is well illustrated, containing numerous plates showing the details of operations. On the whole, it is an excellent statement of the principal advances of gynecology during the last year and a half.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Supervision of G. P. Head, M.D. Vol. V.: Obstetrics. Edited by Reuben Peterson, M.D., and Henry F. Lewis, A.B., M.D. Chicago: The Year-book Publishers. April, 1902.

This small volume gives an excellent *résumé* of the recent literature in obstetrics. It is divided into four parts: the first, Pregnancy; the second, Labor; the third, The Puerperium; and the fourth, Obstetrical Surgery.

Of the articles that are referred to at greater length is the one by J. C. Webster upon human placentation. Placenta previa and its management is fully discussed, especially with reference to Cæsarian section. The various articles that have appeared pro and con upon this topic are abstracted, though the editors do not themselves offer an opinion as to which is the better method. The hygiene of pregnancy is exemplified in the excellent article by Krusen, which is given at length.

One of the longest abstracts in the book is that dealing with eclampsia. That the pathology of this condition is by no means settled is shown by the fact that articles are abstracted in which it is held that the poisoning of the organism is due to products of metabolism, that there is a degenerative process in the kidney epithelium, an increased amount of fibrin in fresh venous blood, that it rises equally from disease in mother and child, that in the disorder there is an increased toxicity of the urine, while in others there is an increased molecular concentration of the blood. The treatment varies from the saline infusions advocated by Groves to Stroganoff's morphine method.

The editors have shown a wise selection in culling from the literature of the current year. The abstracts are sufficiently full to give an excellent idea of the opinions held by the several writers. It is to be regretted that the opinions of the editors are not more freely given.

GENITO-URINARY DISEASES AND SYPHILIS. By Henry H. Morton, M.D. Philadelphia: The F. A. Davis Company. 1902.

The only good part of this work is the preface, in which the author succinctly states the general trend of genito-urinary surgery in the last few years. He emphasizes the importance of vesiculitis, the persistence of gonorrheal infection, and the features of modern surgery in dealing with the enlarged prostate. From the standpoint of text-book making, the work is of little more value than would be the printing of some undergraduate's notes that were taken on a course of lectures. Some of the illustrations are good, especially those that are copied from Finger. The recommendation on page 4, to inject one-half drachm of cocaine in the balanopreputial sac, is probably a misprint, but is a fair sample of the somewhat careless compilation which characterizes the book throughout.

MINOR SURGERY AND BANDAGING. Fifth Edition. By Henry R. Wharton. Philadelphia and New York: Lea Brothers & Co. 1902.

In the preface to the last edition the author says that he has endeavored to present a concise description of the various bandages, surgical dressings, and minor surgical procedures employed in the practice of surgery at the present time. Aseptic and antiseptic dressings have received full consideration. The first portion of the work deals with bandages, including their method of appli-

cation, the materials of which they are made, as well as the usual forms of fixed dressings, molded splints, etc.

Part two deals with minor surgery, and properly opens with a description of surgical bacteriology; then follows the preparation of the aseptic materials for aseptic operations. The third part of the work deals with fractures, ligations, and amputations; we feel that these matters can scarcely be said to belong to minor surgery.

Five editions have been called for in a comparatively short time, which shows that the work is practical and useful, and as such it is to be commended to the undergraduate. It is a brief statement of surgical principles and contains much of minor surgery that is omitted in the larger treatises.

ANATOMY, DESCRIPTIVE AND SURGICAL. By Henry Gray. Edited by T. Pickering Pick and Robert Howden. Revised American from the Fifteenth English edition. Philadelphia and New York: Lea Brothers & Co. 1901.

Gray's Anatomy needs no introduction to the present generation of medical men. It is only necessary for us to call attention to the fact that a new edition has appeared. The present volume contains 1257 pages, and has 780 illustrations, many of which are new and some of them are colored. The successive editions through which this anatomy has passed have served to improve it in many particulars. The Gray of twenty years ago contained many errors; they have nearly all been eliminated, and a large number of illustrations have been added, so that the work now represents modern anatomical science as taught in our medical schools better than any work upon the market. Gray was one of the greatest teachers of anatomy. His arrangement of the first edition is substantially adhered to in this last; while the work has been augmented and improved in many particulars, it will be found to be the same work so familiar to our student days.

COMPEND OF GENERAL PATHOLOGY. By Alfred Edward Thayer, M.D., Assistant Instructor in Gross Pathology, Cornell Medical College; Pathologist to the City Hospital, etc. With 78 Illustrations, Several of which are Colored. 322 pages, 80 cents net. Philadelphia: P. Blakiston's Son & Co. 1902.

This little book, one of "Blakiston's Quiz-compends," is an excellent and comprehensive synopsis of the essentials of general pathology, and will be of great advantage in aiding students review the subjects of which it treats. For so brief a work it is very readable and interesting, quite well illustrated, and full of good definitions, excellent tabulations, and brief, concise descriptions. A student thoroughly familiar with the contents of this small volume could without doubt pass college and State examinations with credit, and could scarcely find himself deficient in anything that is essential to the subject.

LEADING ARTICLES.

A SYSTEM OF RADIOGRAPHY.

A recent clinical lecture by E. W. H. Shenton (*Clinical Journal*, March 26, 1902) is replete with such excellent advice regarding the use of the *x*-rays that we feel justified in publishing a lengthy abstract. The use of the *x*-rays in diagnosis and treatment is still unsystematic, and investigations will have to be carried forward in a more thorough manner if the science is to be further advanced. The *x*-ray examination should eliminate, so far as possible, risk to the patient, and should also be made comfortable to the operator. The operation should be as short as is consistent with thorough examination. Mr. Shenton has had abundant experience as radiographer to Guy's Hospital. He regards skilful screening as the scientific basis of a radiographic examination. The one who simply makes a sandwich of his patient between the tube and the receiving plate may become clever, but he relies upon a single method of investigation. The radiograph is uncertain at best, and while an opinion based upon it may be correct it should be controlled by a careful study with the screen.

As a rule, when using the screen, the patient is more comfortable when lying down. This position makes all parts of the body equally accessible; the screen rests upon the body of the patient and the operator is free from constraint. Particularly is the horizontal position necessary in examining the abdominal and gluteal regions, as these present the greatest opacity to the *x*-rays. In the horizontal position there is some reduction in the anterior posterior measurements, and this facilitates examination.

Photography requires elaborate apparatus. The greater the quantity of Roentgen light that is obtained, the more simple the apparatus. Everything that tends to increase the light simplifies the instruments. There is such a thing as definition in a tube which is comparable in some respects to the use of a fine lens in photographic work. Sometimes a better definition can be obtained from a half-penny magnifying glass in bright sunlight than from a valuable lens where the illumination is less perfect. The tube that gives fine definition, but requires to be illuminated for a considerable period before it impresses the photographic plate, will not give as good a picture as the tube with less defining power and a greater quantity of light, as the chances of the part moving are increased

by the length of time of the exposure. If with a screen of good definition we are losing a quantity of light, we have lost more than we have gained, the screen effects are obscure, and there has to be prolonged exposure to get the same picture. In 99 cases out of 100, the more light the better the results. In a rare case definition may be a *sine qua non*, but these cases occur infrequently in ordinary radiographic examinations.

A number of excellent reproductions of radiograms are given in which various forms of calculi in the kidney are shown with remarkable precision. All these were made with an exposure not exceeding one minute, and with a tube in which definition had been sacrificed to an increase in the light. By shortening the exposures, dermatitis is eliminated. In some thousands of cases during the last two years there has not been a single case of skin trouble. There is one class of cases in which an increase of light is of the utmost importance, and that is in the detection and location of foreign bodies. The complicated apparatus which has been devised for locating a foreign body is unnecessary. If a mark is made upon the skin just above the object sought, and if the exact depth of the latter is given, this is as much service as the x-rays can furnish. To make the mark upon the skin accurately, the part should lie in the position which it is to have at the time of the operation. If the object sought is a bullet, use a large tube so that the foreign body is in the brightest part of the field. With the screen in position, pass a probe beneath the screen, and when the tip of the probe corresponds to the shadow of the foreign body, mark this spot upon the skin. If a needle, mark each end separately. This is the first and most important step in the localization. To find the depth, make use of a principle which is of ready application and familiar to all. As we sit in a railroad train the objects without appear to pass the window at varying rates, according to their distance: the telegraph posts pass with great rapidity and regularity, trees in a field somewhat slowly, and trees on the horizon more slowly still. Experience has taught that those things which are nearer appear to pass more quickly than those which are remote, and that objects that pass at the same rate are equidistant from us.

In examining the hip-joint for a bullet, which is in a portion of the body offering considerable difficulty in radiographic localization, the foreign body is first located with the screen, and then the latter is moved to and fro and in this way gives a rough idea of its relation to the bones. While the tube is being moved to and fro, a probe held in the hand is so adjusted that the probe and bullet move

at the same rate. It does not matter how near the probe is to the bullet, so long as they are in the same plane. The distance of the probe from the screen is easily ascertained, and this marks the depth of the bullet from the mark on the skin.

Mathematical accuracy is not essential to success. During the past year this method in Guy's Hospital has detected foreign bodies with sufficient accuracy to admit of their removal, in all except one case. This exception was a patient who lived in the country, who would not stop to be properly treated. The screens which are used are covered with transparent celluloid, which keeps the surfaces clean and allows of marks being made with a dermatographic pencil.

A large and important class of cases in which radiography is employed is fracture. In the exclusion of a fracture we have one of the most difficult tasks which the rays are called upon to perform. The rule should be to always photograph, if you cannot see a fracture. A fracture is only detected by the derangement of the cancellous tissue, and the screen is too coarse for a proper exposition of this. Photography is of the utmost importance for this purpose.

In many cases it is easy to determine the presence of fracture. A careful examination of the light area which represents the medullary canal is of great value. A want of continuity in this light streak invariably means fracture. If the shape of the bone is unsatisfactory, especially when compared with the one on the opposite side, fracture is generally present. A large extravasation of blood mars, and sometimes completely obliterates, the image of the bone.

The most valuable use of the ray in the abdominal region is in the detection of urinary calculi. In searching for these foreign bodies the screen should be used first in front and then from the back, and any dark area in the renal region which catches the eye should be examined carefully. It is no uncommon thing to see the stone upon the screen. This the writer has observed in eleven cases during the past eighteen months. In photographing these regions the patient is to lie upon the face with the arms above the head. The tube should be moved until the picture upon the screen is satisfactory, or any suspicious object comes well into view; then the plate should be laid across the lumbar region and exposed. In a medium-sized adult thirty seconds will suffice. It is desirable to get a thin negative, as great contrasts, while seemingly the most satisfactory, sometimes defeat the purpose for which the examination was undertaken.

PARASYPHILITIC AFFECTIONS OF THE NERVOUS SYSTEM.

This term, which was invented by Fournier, has become popular of late. It is applied to cases of tabes and general paralysis. If we seek for a definition of the term, we find that it is applied to those disorders which are believed to be of syphilitic origin, but do not yield to antisyphilitic treatment. To speak of general paralysis and tabes as a parasyphilitic infection is to imply that every person who suffers from these diseases has had syphilis. While we are disposed to admit that syphilis plays a most important rôle in the production of these disorders, it is not in accord with our experience that they are the sole exciting causes. We are confident that we have seen typical cases of both of these diseases which were not due to syphilis. We admit that the exclusion of lues is a difficult matter. Syphilis insontium is much more frequent than is generally believed. The diagnosis of syphilis is extremely difficult, and there will be a considerable number of cases, even after the most careful investigation, in which one will be left in doubt as to the venereal antecedents. Allowing everything for the uncertainties, we are not prepared to say, nor do we believe it to be logically defensible, that because the statistics show in the neighborhood of 70 or 80 per cent of cases of tabes and general paralysis, syphilis as a predisposing factor, of necessity the remaining 20 or 30 per cent have suffered from it. We have seen quite as typical degeneration of the posterior columns follow traumatism, as where the disease was due to syphilis. To be sure, these cases have been somewhat different in their clinical history, not having presented the usual progressive character of the affection as ordinarily found. We have also seen tabes unquestionably due to syphilitic infection in which the disease came to a standstill, remaining unchanged for years. There is no reason to think that other toxemias than syphilis may not cause degeneration of the posterior columns, or the peculiar grouping of symptoms known as paretic dementia.

We cannot draw a hard and fast line between ordinary cases of paretic dementia and tabes and syphilis of the cord and brain. We are not now speaking of the majority of cases; in a large number such division is readily made, but we have seen a considerable number of cases in which the symptoms of involvement of the nervous system have come on from five to ten years after the primary infection, and in which there has been a fairly prompt yielding to specific treatment. In these border-line cases between syphilis of the nervous system and the so-called parasyphilitic affections, we would

hesitate to draw an exact line, upon one side of which we would label the cases syphilitic, and the other parasyphilitic.

Syphilis of the nervous system is essentially syphilis of the blood-vessels, and damaged blood-vessels mean a disturbance of nutrition, and any alteration in nutrition may result in degeneration. This, to our mind, seems to be the explanation of the pathology of the syphilitic as well as the so-called parasyphilitic lesions. They all have their origin primarily in damaged blood-vessels. It is possible that in certain cases of paretic dementia we may have an underlying toxemia of an apparently acute sort, and we believe that the statistics will not show quite so large a proportion of cases of paretic dementia with syphilitic antecedents as with those of tabes.

EDITORIAL COMMENT.

QUACK ADVERTISING.

Not long since a man who had heretofore borne an excellent reputation in the profession entered the field of the advertiser. For some reason he had become dissatisfied with the rewards of the legitimate practice of medicine, and thought to increase his income by a resort to questionable means. In a conversation at a medical meeting not long afterward the action of this man was referred to, and the fact that patients were flocking to his office was lamented. The apparent success which this individual was achieving led to a discussion of the returns from professional advertising. A study of the field of quack medical advertising in the city of Chicago shows a considerable number of men who have gone from the ranks of the medical profession into the domain of the quack medical advertiser, but in no single instance have they been successful. One of the more recent and apparently most successful advertisers, using sometimes a whole page in one of the large dailies in exploiting his skill in the treatment of chronic diseases, has failed. His magnificent offices have been closed, and gradually the flaming advertisements have been lessened in extent, until now he is reduced to very modest quarters, and his name scarcely appears in the advertising columns of the daily papers. This has been the experience of most advertising specialists of late years. A few seem to be able to make a fair living by this means, but they are men who have devoted years to the study of the problem, and the same rules obtain in exploiting their business as in any other commercial enterprise. The returns, however, from the most successful are inconsiderable when compared with the ordinary professional incomes. When it is necessary to spend from seventy to ninety cents to get a dollar into the office the profit is reduced so much that the business is ever verging upon failure. Some of the most imposing examples of quack advertising during the past few years show a loss. The individual to whom we have referred more particularly is at least $200,000 in debt, a large share of which is due the lay press of Chicago, and it is believed by those who are conversant with the affairs of this man that, while his income was very large, running into many thousands of dollars a month, the actual outlay for offices, advertising, apparatus, etc., and the paraphernalia of an impressive quack, far exceeded the income.

What does this teach in reference to quack advertising? Why, simply that professional honesty is the best professional policy, and in the end it pays best. The fact is that professional incomes are not excessively restricted, notwithstanding so many statements to the contrary in the periodical medical press. Physicians are often extravagant, and their expenses are out of proportion to their incomes. Compared, however, with the ordinary practice of the profession, the way of the quack advertiser is vastly more difficult in a commercial sense. He has to have a far better grasp of financial matters than does the average physician, and the percentage of failures is much greater. Especially is this true of one who has been educated up to the ordinary ethical standpoints of the profession. When he is lured from the path of rectitude into the devious way of the advertising specialist, failure is inevitable. The quack, like the poet, is born, not made.

KEEPING WELL.

The Chinese system of employing physicians has much to commend it. It is said that these people do not pay a physician for his attendance upon the sick, but he is employed by the year, and his compensation is directly proportionate to the health of the individual; that is, his pay at the end of the year is proportionate to the health enjoyed by the individual, and a deduction is made for all sick days. We are told that modern medicine is essentially preventive medicine, and certainly in the matter of public prophylaxis we can refer with pride to recent advances. In the domain of individual prophylaxis, little progress is to be noted, and what improvements have been made are largely in the prevention of acute diseases.

Individuals have learned that in the care of the teeth, preventive measures are far ahead of those which deal with the repair of extensive alterations. It is a common custom for individuals to go to a dentist every three or six months, have their teeth looked over, and have such things done for them as is necessary. A similar custom would do much to ward off those chronic changes of internal organs that begin insidiously. How valuable it would be to detect the early trace of sugar or albumin in the urine, the accentuation of the second sound of the heart, or the slight increase in vascular tension, is only known to those who care for the late manifestations of disorders of which these are early symptoms. Occasionally a life insurance examination reveals some of these conditions, and one of

the cases reaches the physician before the subjective sensations of the patient would lead him to consult a practitioner. The time to cure these cases is early, or, if not to cure, at least to so direct the hygiene of the patient that the more severe consequences are obviated or delayed. After the chronic conditions have advanced to where there is extensive alteration of tissue, then there is practically no hope of cure and but little of prolonging life.

We believe that this field of individual preventive medicine will ultimately be an important part of medical practice. A thorough physical examination at least every year, better every six months, would be a valuable investment for most individuals. It would lead to such advice and regulation of the habits as would ward off those early senile changes characterized by alteration in the blood-vessels and fibrous tissues. Particularly would such an examination be useful in those who are past forty years of age. An examination to be of service must be a thorough one, and must not consist of a visit to the physician and a perfunctory questioning as to the subjective symptoms of the patient. It should include a thorough examination of the respiratory and circulatory organs; a study of the vascular pressure by instruments of precision; an examination of the blood and a careful study of a twenty-four-hours' specimen of the urine. This, with an examination of the nervous system and an ophthalmoscopic examination and a rough testing of the optic refraction and of the hearing, would show tendencies to diseases in their incipiency. This would ultimately mean that we would be compensated for our services in keeping people well, rather than treating them after they have become sick.

THE DRESS OF THE PROFESSION.

An examination of ancient prints shows the fantastic dress which was thought necessary for physicians in the middle ages. The enormous spectacles, wig, and cane, and in epidemic diseases the leather clothes, and where special infection was feared, such as the plague, the enormous mask, constituted some of the armor worn by the physician. Later, when the fear of infection seemed to have somewhat given way, a fantastical garb would describe that which was quite in vogue down to the beginning of the last century. Irving says of Goldsmith, when he reëntered the medical profession for the purpose of securing an income, that he appeared in a professional wig, a cane, purple silk small-clothes, and scarlet roquelaure buttoned to the chin. Down to quite recent times the wig and cane

were the insignia of the profession, but the former has been discarded, and the latter has given way to the obstetric bag which now seems to be the distinguishing badge of the physician, particularly the young practitioner. The medical man of to-day dresses the same as the average business man or lawyer, excepting for the first year or so after his graduation, when he usually blossoms out in a lawn tie for morning, a Prince Albert coat, an obstetric bag, and a silk hat. These, combined with a somewhat important carriage and a hasty stride, are sufficient to distinguish him as a succorer of the sick. With increasing practice and a decreasing sense of his own importance in the community, these more distinctive marks of the profession disappear.

There are still to be found older members of the profession whose neckwear has a suggestion of the stock of sixty years ago, and now and then one who adheres to the claw-hammer coat of his youthful days. With these few exceptions the dress of the profession has rapidly assimilated itself to the costume of the average individual. So much is this the case that it has been necessary for the Health Board of the city of Chicago to issue a button to distinguish physicians, so that on occasions where their services are needed they may have precedence at barriers erected by the police or at bridges or in other crowded places.

There are some advantages in a distinguishing dress, and also some disadvantages, the latter being especially appreciated by the older members of the profession. The chance call, the interruption of social pleasures, the failure to catch the train, or other occurrences which may happen to the conspicuously designated physician, will always serve to emphasize a certain modest unobtrusiveness as the best attitude of the profession.

The only modern requirement that should be emphasized in the dress of the physician is cleanliness. The public are already apprised of what asepsis means. They are also beginning to understand that hygiene means simply cleanliness, and the untidy physician will soon find himself at the bottom of the professional ladder.

THE INCREASE OF DRUG ADDICTION.

We have frequently referred to the increased use of morphine, chloral, and other drugs which serve in some measure to replace alcohol with those who have a tendency to drug addiction. How extensive this is we have no means of knowing, but when the statement is made that not more than one-tenth of the cocaine which is

sold by wholesale dealers is accounted for by the legitimate demands of medicine, one can but wonder what becomes of the remainder. Restrictions have been placed upon the dealers in alcoholic liquors, high licenses are required, and in many States strenuous efforts have been made to repress the use of alcohol entirely. That these efforts have not met with a commendable degree of success is due to the fact that the enforcement of sumptuary laws is very difficult. Notwithstanding the most strenuous efforts at suppression of the liquor traffic, there are constant evasions. We have referred repeatedly to the poisonous effects of essence of ginger and other substances which have been taken because alcohol could not be obtained. A popular evasion of the liquor laws is in the extensive use of patent medicines, which, under a high-sounding title, sell a comparatively poor quality of spirit at high price.

As an indication of the extent to which the drug addiction is replacing alcohol, we would refer to the twenty-ninth annual report of the House of Correction of the city of Chicago. The house physician, Charles E. Sceleth, in his report says: "I desire in this connection to call your attention to the steadily increasing number of 'dope fiends' who are being sent here. These people, as a rule, are not criminals, but are physical wrecks, with minds unbalanced, from the excessive use of opiates; reduced to mere shadows of their former selves, and covered with scars and abscesses. They require from two to three months' care, attention, and good nourishment, at the expiration of which time they usually regain their normal condition and are discharged in good health. The ease with which opiates are now purchased in certain markets in this city, some being sold without doctors' prescriptions, and in quantities as small as five cents worth—some druggists even administering the 'shot' where the patient is unable to purchase the syringe—is responsible for the steadily increasing number, and for the recommitment of this class so frequently."

THE CHANGE FROM RURAL TO CITY LIFE.

A recent article in *La Presse Médicale* gives the movement of population in reference to residence in cities and rural districts in France during the last fifty years. In 1846, about 75 per cent of the inhabitants of that country lived in the country and 25 per cent in cities. About five years ago the relative percentage was 61 rural to 39 urban. During the last five years there has been only a slight relative change in favor of the cities.

This tendency toward city life has had an important influence upon the health of the community, and has unquestionably been one of the chief factors in the diminishing birth-rate which is noted throughout the world, but especially in France, America, and to a less extent in Great Britain. The same relative excess in city population as compared with the rural has been taking place in all civilized countries. We are quite sure that the experience of France, which shows a marked check in this tendency, will also be repeated in other countries. It is interesting, if opportunity permitted, to discuss the factors which lead people to leave the country and to dwell in cities, and again, that which has set up a reverse tide.

Unquestionably the large development of manufacturing as compared with agriculture, and the division of labor, as well as the development of the factory system, have operated to increase the population of large centers. The question of transportation and its solution by the development of trolley lines and other means of rapidly carrying people long distances will again solve the problem of a rural residence, and will permit people to live in the country, while following an occupation in the city. This tendency toward enlargement of the suburbs of the city is increasingly apparent, and it is evident that the next few decades will see our cities enormously extended, but not nearly as compactly inhabited. The effect of this upon sanitation and the public health will be very marked. In some respects there will be an improvement, as greater light and air will be possible with the increased space, and the noisome tenement will give way to the small cottage and its plat of ground as a dwelling for laboring people. Such an extension of the city population will introduce other problems, not a few of which are becoming painfully apparent in cities covering such an enormous area as does Chicago. The problem of maintaining the public utilities, such as well paved and lighted streets and proper police protection, is very considerable. This to a large extent increases taxation, and at the same time decreases the efficiency of the service. While some sanitary problems are solved by an extended area inhabited by comparatively few people, there are other problems that are made more difficult. Whatever these are, they will have to be met, as a tendency such as we have described is not made to order, but follows some natural law.

EUTHANASIA.

The recent distribution of the magnificent bequest of the late Alfred Nobel gives added interest to his peculiar views on this topic. The assertions are from a correspondent of the *London Spectator*, and

were suggested by the recent introduction into the Parliament of Saxony of a bill for duly qualified physicians to put to death all persons suffering from an incurable disease. Nobel, it is asserted, at one time asked Crispi, the Prime Minister of Italy, for permission to erect and maintain at his (Nobel's) expense, in Rome and Milan, euthanasia houses. These were to be handsomely fitted up and equipped with a generator for a deadly gas which would produce painless death. According to the inventor's arrangements, any one who desired to avail himself of one of these institutions would make an appointment, and at the hour named would be ushered into a room handsomely furnished and sit down to an abundant repast served forth with wines. At the conclusion, and while quietly enjoying his cigar, the atmosphere of the room would be impregnated with this deadly gas, and he would quietly and painlessly pass away, and the following morning his body would be cremated. It is needless to say that Crispi did not approve of this idea.

The *New York Tribune* of February 15, 1902, in commenting on the above, says that no civilized government could entertain such an idea. Euthanasia has always been condemned by Christians. However much the churches may differ in other respects, they all agree in believing that suicide is a crime. In spite of this opposition, it is the opinion of the *Tribune* that euthanasia is growing in favor, though many who believe in it do not care to make themselves unpleasantly conspicuous by avowing their views. It is said that the belief is making headway, especially among physicians, an increasing number of whom believe that it would be a kindly act to terminate the sufferings of those who cannot be cured.

In our opinion, the *Tribune* does not correctly state the position of the medical profession. While they do what they can to mitigate the pains of those who are the victims of an incurable malady, we are sure that there is not even a small minority of the profession who are in favor of voluntarily terminating life. The difficulty would always be one of diagnosis. The malignant tumor may unexpectedly take on retrogressive changes, the failing cardiac compensation may be reëstablished, or the kidneys that have been performing their functions imperfectly for months may suddenly renew their activity. The difficulty would be in determining when any case was absolutely incurable. This subject has little more than an academic interest, but the fact that it is discussed now and then in our leading journals makes it worthy of comment.

THE ACTION OF LIGHT UPON THE BODY.

The experiments of Finsen in the treatment of lupus by actinic rays have attracted the attention of the medical world to the value of light in the treatment of disease. Prior to the careful work of Finsen, light baths, whether electric or solar, had received considerable attention, but it was believed that the accompanying suggestion was of more importance in the treatment of the diseased condition than was the direct action of light. The bactericidal power of light is so often demonstrated in the laboratory that it again attracts attention to its possible therapeutic value. That light is capable of penetrating the hand, or other structures of considerable thickness, has long been known, but it is not the light which is transmitted which is necessarily effective, but that which is absorbed. Hence, even though we cannot see the transmission of light through the trunk of the body, it may have a varying power of penetration and thus be beneficial in modifying the deeper structures. It is rational to suppose that the more superficial the tissues which are thought to be affected, the more efficient the application, but this does not imply that even the deeper tissues may not be influenced.

W. S. Gottheil and M. W. Franklin have recently studied the question anew. They refer to the observations of Gadneff and Soluchat, who have shown that silver salts, sealed in capillary tubes, when introduced into the tissues are reduced by actinic rays. Freund has shown by the spectroscope that chemically active as well as visual rays pass freely through epidermis of considerable thickness.

Gottheil and Franklin used an electric arc light with condensers so arranged that the rays of light were brought nearly parallel, and of sufficient size to cover the plate employed. Every care was taken to exclude the plates from the action of light, other than that which passed through the body. With light on the anterior surface of the forearm and a plate on the back, the thickness of the transilluminated tissues being eight centimeters, an exposure of ten minutes showed distinct shadows of the radius and ulna. The same experiment repeated on the shoulder showed a varying deposit, due to differences of density in various parts of the scapula. The conclutions drawn from their experiments are that light in proper concentration from a source of sufficient actinic power can be made to penetrate the entire thickness of the human body; hence all the internal organs are accessible to its influence. The proof of the penetration of actinic rays through the organs of the body opens a field for its successful employment as a therapeutic agent in internal maladies.

SUDDEN DEATH.

To any one who has been called upon to make a large number of post-mortem examinations for forensic purposes, a surprising number of cases of sudden death will be found in which no appreciable lesion can be discovered post mortem. These are variously labeled heart failure, congestion of the brain, or other still more vague appellations. Recently the Paris correspondent of the *Lancet* (March 22, 1902) referred to a report of M. Lancereaux, made to the Academy of Medicine, upon fifty post-mortem examinations of individuals who had died suddenly, and whose death was wrongly attributed to embolism or rupture of an aneurism. In these cases all the organs were perfectly healthy, particularly the heart, which was empty, as is observed in physiologic experiments in death from bulbar anemia. Death was attributed by Lancereaux to a gastric reflex, and it was observed chiefly in gouty dyspeptics. In these cases there was great irritability of the heart, even when it was otherwise normal, but especially when it was at all dilated, or much overlaid with fat; it was well known that indigestion might easily produce cardiac palpitation, weakness, or even syncope. A sharp blow on the pit of the stomach or the ingestion of ice water was able to bring about sudden death by the arrest of the heart. Starting with these considerations M. Lancereaux found that his cases of sudden death occurred at very significant times in the day—that is to say, from four to five hours after the midday meal, or two or three o'clock in the morning. They occurred at such a distance after a meal that digestive troubles were beginning to be felt in dyspeptics who suffered from dilated stomachs.

REFLEX CAUSES OF DISEASE.

A great superstructure of theory can be raised upon a modicum of fact in medicine, particularly if the theory has some bearing upon the treatment of disease. A study of the literature of medicine during the last two decades shows the enormous application of the reflex theory of disease. When one studies the basis of this theory he finds that it is exceedingly narrow. A child suffering from convulsions is given a teniacide, a tapeworm is expelled, and the convulsions cease; *ergo*, children who have convulsions have tapeworms, and consequently are to receive worm-medicine. An adherent prepuce is amputated, and by the time the wound is healed an accompanying chorea has disappeared; therefore, chorea is dependent upon preputial adhesion, and circumcision is a proper remedy for this disorder.

We could go on multiplying instances to an unlimited extent, but the climax was reached when the normal ovaries and the clitoris were sacrificed on the altar of reflex pathology.

There has been a strong reaction in recent years against this theory of the reflex origin of disease. The pendulum has swung so far in the opposite direction that we may overlook some important truths, namely, that while a very small proportion of epileptic seizures are due to tapeworms, there is occasionally one that is; that the majority of cases of chorea are not dependent upon an adherent and inflamed prepuce, and that there is an occasional case in which the local disturbance set up by such a condition maintains an unstable condition of the nervous system in a child, which may seriously retard its development.

The only reflex symptom that seems to have come out of the chaos and been placed upon a secure foundation is the relation of eye-strain to headache. Like all other theories it has been carried too far by many ophthalmologists, and the tenotomies and "glassing the diseases" have been so common as to excite merriment.

The danger in the reflex theory of disease is that it will be carried too far upon the one hand, or neglected upon the other. It is a well established fact that occasionally disturbances of the rectum, of the urethral orifice, within the pelvis, may cause profound disturbance of the general health. These should be earnestly sought for and removed; but when an entire theory of medicine is founded upon a conception of disease so narrow as that of the "reflex theory," then it is no more worthy of belief than are the vagaries of the osteopaths or the orificialists.

THE SARATOGA MEETING OF THE AMERICAN MEDICAL ASSOCIATION.

The 1902 gathering of the American Medical Association was an epoch in the history of the association. The meeting was chiefly characterized by the transference of the executive business from the large general session to the House of Delegates, representing the sections of the association and the State medical societies.

When the House of Delegates assembled it was inevitable that a certain amount of confusion should arise, due to the fact that they were unorganized, had no precedents, and were working under a new constitution that was unfamiliar to most of the members. The first session was practically wasted, as there was no well defined plan of procedure, but at that session several committees were

evolved. The Committee upon Business formulated the work of each session after the first, and the House of Delegates, as a working body, became an established fact. It was soon evident that the Delegates were there with the firm intention of disposing of business; there was no place for the orator in the sense that oratory has been displayed in times past on the floor of the general session. A body of less than one hundred does not encourage oratorical effort of the spread-eagle variety. What was said was to the point in debating the question at issue, and was largely of a conversational character. To sum up the proceedings of the House of Delegates, we can only say that its sessions were marked by decorum, business was transacted promptly, and, on the whole, its meetings were eminently satisfactory and gave great encouragement for the future of this body. A practical criticism on the conduct of business was that the procedures were not sufficiently digested beforehand, and too much opportunity was afforded for individual judgment in precipitating debates on questions of minor interest. This together with the uncertainty as to why it was gotten together which characterized the first meeting were the only serious criticisms that could be raised. Much of this will be eliminated at the next session, when it may be expected that the House of Delegates will meet with a well digested plan by which its business will be disposed of in half the time taken up by the last session. The chief criticism that could be offered was the length of time that the House of Delegates was in session, this keeping a large number of its members from the section work, or seriously interfering with their attendance. This can be obviated in the future by having a short morning and late afternoon session and by the establishment of standing committees or the use of the committee of the whole by which debate can be had upon special topics by those who are interested, and at the same time the House need not be kept in session. The appointment of the Committee on Business as a sort of *omnium gatherum* to elaborate almost all matters that were brought before the House, as a temporary expedient was fairly satisfactory, but it resulted in limiting debate upon the floor of the general body, which is a distinct loss in such an organization. A better devised set of rules will obviate this and promote a more extended discussion by the House.

ABSTRACTS.

MEDICINE.

Congenital Hereditary Family Hematuria.—GUTHRIE, I. G. *Lancet*, vol. clxii, No. 18 of vol. i, p. 1243, May 3, 1902.

The cases reported, twelve in number, presented a typical hematuria. Eight were brothers and sisters, or first cousins. Their mothers are two sisters, both subject to this complaint, and these two sisters had two brothers, both of whom were similarly affected. The disease presents a family type, and is hereditary, but has only descended to the second generation. Seven were women and five men. The hematuria in these cases was found to vary in persistency. In some cases it ceased for a time, but in all there was a tendency to paroxysmal attacks. In one of the best observed cases, which was examined weekly for upwards of two years, the urine contained blood which could be detected by the naked eye in every specimen. The duration of attacks where the condition is paroxysmal was usually several days, seldom exceeding a week. There was no definite interval that elapsed between the attacks, but they seemed to be less frequent after the tenth year. They occurred with extreme suddenness, by day or by night, and were not influenced by posture. Extremes of heat and cold weather seemed to give rise to them. The condition was not associated with other symptoms, or cardiovascular changes. With the exception of when the attacks occurred the patient seemed to be in perfect health, and the anemia which followed a severe hemorrhage was not extreme or lasting. The amount of urea, the specific gravity, and the quantity of the urine were normal.

Localization of the Mental Faculties in the Left Prefrontal Lobe.—PHELPS, C. *American Journal of the Medical Sciences*, vol. cxxiii, No. 5, p. 751, May, 1902.

In a previous communication Phelps has come to the conclusion that the mental faculties largely reside in the prefrontal lobe of the left side, basing the deduction upon his experience in the treatment of cases of injuries of the front part of the brain. In the present communication he gathers from the literature such cases of injury to the frontal lobes as are available for analysis. These are divided into three groups: (1) Atrophies; (2) pistol-shot wounds;

(3) abscesses and tumors. Pistol-shot wounds offer the best opportunity of comparing the symptoms of injury of the prefrontal lobe upon the right and left sides. Of the cases which lend themselves to accurate analysis, it is found that in twenty-six, where the cerebral wound was confined to the right side, there were no symptoms of mental or emotional disturbance, aside from the stupor or delirium that is characteristic of general contusion. Of thirty-two cases in which the ball traversed the right frontal lobe, in eight there was no means of determining the mental condition. In thirteen the manifestations of mental derangement were distinctly evident. In several of the others the mental condition was not specifically mentioned, and the histories were otherwise deficient. There were still a limited number of cases in which, with a wound of the left lobe, the mental faculties were said to have been unimpaired. Some of these cases are stated to have exhibited some form or degree of aphasia, and in nearly or quite all of them the lesion was in the posterior part of the lobe. This series of cases, so far as the histories are complete and intelligible, shows that emotional and intellectual disturbances are symptomatic not only in a lesion of the frontal lobe, but also in its anterior and central portions. Cerebral abscesses and tumors involving the frontal lobes confirm these conclusions.

A Case of Relapsing Pyrexia Continuing for Fourteen Months.—NEAVE, S. H. N. *Lancet*, vol. clxii, No. 17, vol. i, p. 1177, April 26, 1902.

The patient, a male, 70 years old, was in his usual health until February, 1901. He had spent the whole of his life in a house close to the London docks. In that month he began to have attacks of pyrexia at regular intervals. The leading subjective symptom was a desire to sleep by day as well as by night. In the intervals of the attacks he felt quite well and attended to his employment. For the past six months he has been an inmate of the Royal Free Hospital, and during that time has passed through nine cycles of fever in 172 days. The actual number of days of remission and days of pyrexia is as follows:

Fever.—11, 12, 12, 14, 14, 13, 14, 12, 14.

Remission.—7, 7, 6, 5, 6, 6, 6, 7, 6.

The only physical signs that were in any degree prominent were a slight increase in splenic dulness and an enlarged gland in the left axilla. The temperature during an attack rises to a maximum of 105° F. on the third or fourth day, and on the tenth day it comes down to 97° with some depression. The patient has very little discomfort, but is drowsy and has some bronchitis. Vomiting occurs

at the highest point of temperature, there is some tenderness over the spleen, and the blood-count shows a leucocytosis of 16,000. The blood was examined for malarial parasites—spirillum obermyeri —and the reaction for Malta fever was looked for; all with negative results. During the remissions the patient appears to be fairly robust, though somewhat anemic, the blood showing a deficiency of hemoglobin. There is not much wasting, and he generally feels quite well, though during the entire period of six months there has been some loss of weight. The question of suppurating foci, cholecystitis, as well as hepatic intermittent fever, has been kept in view. The cerebrospinal fluid is sterile. There are no renal symptoms, and the urine is normal. Negative results followed the exploration of the nose, the nasopharynx, the larynx, and rectum. The ear and special senses and the fundus oculi were normal.

Eye Symptoms in Glycosuria —PYLE, W. L. *American Medicine*, vol. iii, No. 16, p. 639, April 19, 1902.

Diabetes mellitus or other disturbances of carbohydrate metabolism may affect any portion of the visual apparatus. The changes are produced by chemical or physical means, or indirectly through the associated general debility. The ocular disturbances vary in intensity from a slight failure of vision to a formidable retinitis, or total optic nerve atrophy. Minor visual disturbances are often made worse by fatigue, or increased cardiac action, and may improve after prolonged rest, or a decrease of vascular tension. The intra-ocular disturbances may be exclusively unilateral, and there is never seen ophthalmoscopically inflammation of the optic nerve; this serves to distinguish between the changes in diabetes and those caused by albuminuria, syphilis, and other blood disturbances. Albuminuria may exist with glycosuria, and the retina may present a mixed picture, or an atypical albuminuric retinitis may be present with diabetes. Central amblyopia may exist with glycosuria independent of the influence of alcohol or tobacco, or in patients addicted to the habitual use of these substances. In chronic cases of glycosuria, with the exception of cataract, the ocular symptoms are often present when the constitutional and urinary symptoms are not marked.

Glycosuria should be suspected in the following conditions:

(*a*) Premature presbyopia.

(*b*) Unexplained mydriasis or cycloplegia.

(*c*) Sudden change in the refraction, particularly marked development or any increasing myopia beyond middle age, without cataract changes.

(*d*) Intractable iritis.

(*e*) Cataract in young or middle-aged persons.

(*f*) Retinitis, particularly the hemorrhagic variety.

(*g*) Unexplained optic nerve atrophy.

(*h*) Sudden and marked amblyopia, particularly central, without visible fundus changes.

Stroking Auscultation in Outlining the Stomach Wall.—BLAD, A. *Berliner Klinische Wochenschrift*, 59th year, No. 16, p. 363, April 21, 1902.

A simple and easy method of outlining the stomach wall is of the utmost importance to the internist as well as to the surgeon. The ordinary method of inspection and percussion determines a portion of the stomach, but does not give its limits. Dilatation by gases, the introduction of sounds or spirals of metal are all of value, but some of them are dangerous under certain circumstances, and they are all more or less disagreeable to the patient.

In stroking auscultation, the stethoscope is placed over the organ which is to be examined and the finger is rubbed lightly over the surface, or a very slight tapping is made toward the edge of the organ. The sound is conducted to the stethoscope near the point at which the stroking or tapping is made. The same method can be employed in outlining the superficial lying intestines, such as the colon, or it will determine the edge of the lung. There is a possibility of applying the same method to the solid organs. The stethoscope applied over the liver or spleen perceives, as the percussion is made over the organ, a certain tone, which is altered when the percussion passes beyond the border of the organ. The writer believes that stroking gives the best results. An ordinary stethoscope or a phonendoscope may be employed. Naturally the rigid monaural stethoscope does not lend itself so readily as the binaural.

The greatest value in the method is in outlining the stomach wall. This can be done whether the stomach is empty or not. It is exceptional that the stomach does not contain a certain amount of gas. This method of outlining the stomach wall has been studied upon bodies and its accuracy fully determined.

The Relation of Blood-pressure to Chronic Nephritis.—V. CZYHLARZ, ERNST. *Wiener Klinische Rundschau*, 16th year, No. 16, p. 299, April 20, 1902.

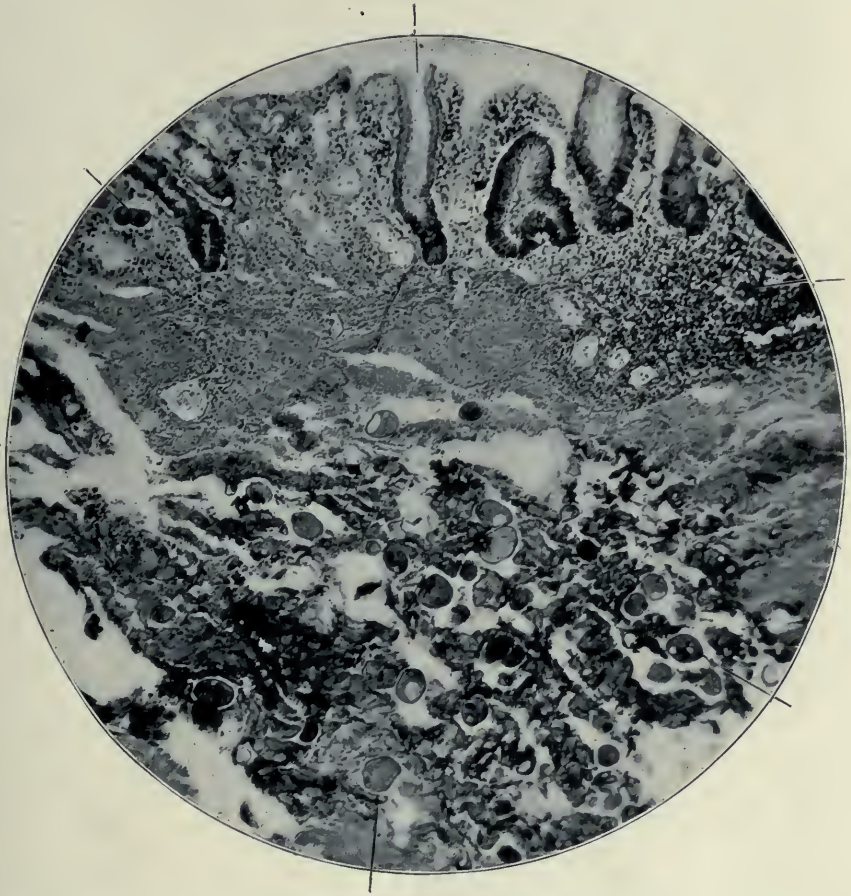
The writer has used Gaertner's tonometer in the study of several cases of chronic nephritis. The criticisms that have been leveled at this instrument have thrown doubt on the results obtained with it,

but the observations of Czyhlarz make the instrument worthy of a more extended trial, particularly in the treatment of those disorders in which there is increased vascular tension. The tonometer shows a different reading with different fingers, and its readings probably have little value as an absolute scale in measuring blood-pressure, but its relative value may be of great importance, particularly in the treatment of diseased conditions accompanied by high vascular pressure. One of the cases reported by the writer is that of a man thirty-one years of age, suffering from chronic interstitial nephritis. At the time he came under observation he was passing 2600 cubic centimeters of urine having a specific gravity of 1.012, and containing one-half per cent of albumin. A few granular cylinders were found. The tonometer measured 210 millimeters. He was placed in bed and put upon a milk diet which was continued for about a month. There was little alteration in the quantity of the urine during that time, and no marked decrease in its specific gravity, but all the subjective symptoms of the patient improved. The tonometer readings gradually fell to 155. The albumin still remained in the urine. The tonometer possibly has a valuable field in the treatment of chronic nephritis, heart troubles, and vascular lesions, as the relation of blood-pressure taken under like conditions in the same finger is probably fairly constant at different times for the same individual.

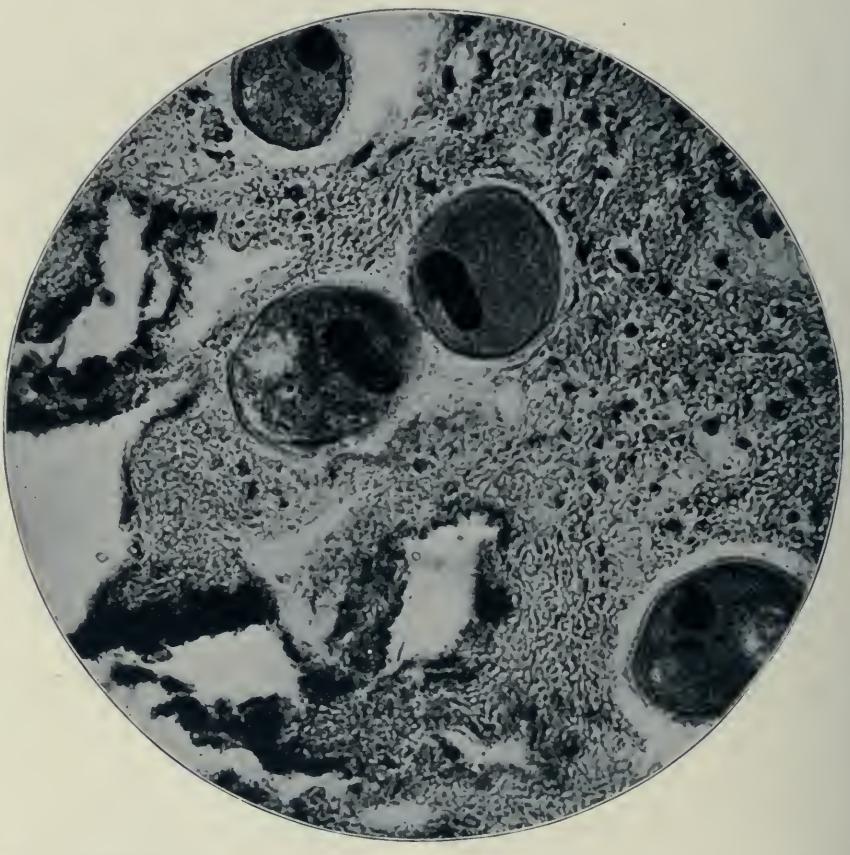
The Pathogenesis of the Balantidium Coli.—BROOKS, HARLOW. *New York University Bulletin of the Medical Sciences*, vol. ii, No. 1, p. 1, January, 1902.

This parasite was discovered by Malmsten, in 1857, in the mucous discharges of a patient who had suffered from persistent dysentery. The parasite is from 70 to 100 microns in length, and from 50 to 70 microns in breadth. It is an actively motile parasite, moving about chiefly by the aid of long cilia, with which it is covered. The organism is sometimes found encysted, and then it is with difficulty destroyed, but ordinarily its motions are checked by moderate heat or cold, and it is readily killed by the ordinary antiseptics. When encysted, it is more resistant. By some the parasite is regarded as not actively pathogenic in man, though Stengel is of the opinion that a parasite of such size and activity could not exist in the intestinal tract without causing disturbance. It is thought by some to play an important part in the development of tropical disorders.

The writer has studied an epidemic of dysentery caused by this parasite which occurred among apes. In all four animals were



Microphotograph of a section through an ulcer of the colon. Showing the undermined character of the ulcerations and the presence of the balantidium coli in the submucosa. From the colon of an orang-utang. (Magnification, 94.5 diameters.)



Microphotograph showing the presence of the balantidium coli in the transverse muscle coat of the intestine. Section from case of orang-utang. (Magnification, 850 diameters.)

affected, three males and one female. The symptoms appeared shortly after the administration of cod-liver oil, and were the same as those of acute dysentery in the human being. The stools were frequent and fluid and contained large flakes of mucus occasionally tinged with blood. Two of the four animals died, one in the acute stage of the disease. Post mortem an ulcerative colitis, and in the mucus of the intestine large numbers of actively motile balantidium coli, were found. No other parasites were found. The post-mortem examination of the other ape, in which the symptoms were less marked, but which had refused food several days before death and died of anemia, showed the stomach and small intestines to be nearly normal and empty. Some ulcers were found in the colon, as in the first animal, and a few balantidia. A possible source of the infection was found in the discharges from turtles which were kept near the cage of apes. This parasite was found constantly present in the discharges.

The two cases in human beings reported by Malmsten are obscure. The definite pathologic changes found in the apes led to the conclusion that the parasite is probably a definite pathogenic agent in the production of dysentery.

The Diazo-reaction.—JOHNSON, M. *St. Petersburger Medicinische Wochenschrift*, 27th year, No. 11, p. 95, March 16 (29), 1902.

The value of the diazo-reaction has been questioned of late, and the test has been abandoned by many hospitals and practitioners. Especially is this true since the advent of the Widal test, with its greater accuracy. We have always contended that the diazo-reaction was of value in estimating the progress of the case and determining the prognosis. It is to be remembered that the test is simple, is easily applied at the bedside, and may be used by an intelligent nurse if properly instructed.

The writer has used the test in 1221 cases, and the results are set forth in the following table:

DISEASE.	NO.	POSITIVE REACTION.	NEGATIVE REACTION.
Abdominal typhoid	728	586 (80.5%)	142 (19.5%)
Pulmonary tuberculosis	309	142 (46%)	167 (54%)
Fibrous pneumonia	90	17 (18.9%)	73 (81.1%)
Malaria	42	11 (26.2%)	31 (73.8%)
Erysipelas	46	11 (23.9%)	35 (76.1%)
Meningitis	4	0 (0%)	4 (100%)
Recurrent fever	2	2 (100%)	0 (0%)

A Method of Sedimentation of Sputum. — QUENSEL, U. *Nordiskt Medicinskt Arkiv*, 1901, Afd. ii, Häft 4, No. 22.

Numerous methods have been recommended for sedimenting the sputum in examination for the tubercle bacilli. One of the latest is that by Quensel, who places the sputum in a flask of from 200 to 300 centimeters capacity and adds to it an equal volume of 25-per-cent formalin and 95-per-cent alcohol. The mixture is then shaken. There is formed a thin emulsion, which is allowed to subside in a conical glass, or it may be centrifugalized. With this method the sediment is commonly not voluminous, and is easily spread upon an object glass. It dries readily in the air, and then is easily stained.

SURGERY.

Three Hundred and Twenty-eight Operations upon the Bile-passages. — MAYO, W. J. *Chicago Medical Recorder*, vol. xxii, No. 4, p. 327, April 15, 1902.

The statistics of this extended series of operations show that 311 of the number were of benign origin, and the deaths from operations were eight. Seventeen were for malignant disease, with three deaths. In 214 cases stones were located in the gall-bladder or cystic duct, or both, and of this group there were two deaths. In 10 per cent of these cases there was obstruction of the cystic duct by a stone. The after-history of many of the cases in which the cystic duct is involved and simple cholecystotomy was performed was not favorable. This operation is not efficient when stones have been lodged in the duct for a length of time. The gall-bladder should be extirpated at the primary operation if the patient's condition is good. Stones in the cystic duct are sometimes more easily removed with the gall-bladder than without it. The peritoneum uniting the gall-bladder to the liver can be divided upon each side, and the connective tissue between can be easily separated with the finger. The muscular and peritoneal coats may be divided just above the cystic duct, and the mucus tube of the latter may be readily stripped out, bringing the stone with it.

Thirty-four cases were operated for cholecystitis. Two of the cases of acute suppurative cholecystitis followed typhoid fever. In both of these the typhoid bacillus was found in pure culture, and the patient's blood gave the Widal reaction. Among these thirty-four cases were five deaths, which emphasizes the serious nature of the infection.

In thirty-one cases stones were found in the common duct. But one patient died in this group of cases. In only one instance was it possible to remove the stone through the cystic duct. In twenty-nine cases the duct was incised and the stones removed. In five cases this was accomplished by separating the gall-bladder from the liver and incising the free surfaces down to and along the cystic duct to the common duct. Jaundice in connection with stones in the common duct was a variable feature. In many cases it was so slight as not to attract special attention, and the finding of stones in the common duct was a surprise. In the majority the jaundice was marked. In many of the cases of jaundice there were subcutaneous ecchymotic spots looking like purpura hemorrhagica, and a number of these cases died from capillary oozing shortly after operation.

Vaginal Section in Cancer of the Rectum.—KRUSEN, W. *American Medicine*, vol. iii, No. 19, p. 778, May 10, 1902.

In a paper before the Southern Surgical and Gynecological Society on "Resection of the Rectum per Vaginam," Murphy reported a new method of dealing with rectal cancer, and cited five cases in which the peritoneal cavity was opened and an exsection of the rectum was performed through the posterior vaginal wall. Since then Krusen has operated upon a case in which the disease was located in the lower third of the rectum and the infiltration was not extensive. In reaching the diseased tissue, an incision was made in the middle line through the posterior vaginal wall down to the rectum. This incision exposed the diseased mass, and its extent could be easily outlined. Owing to the low situation of the tumor, it was not necessary to open the peritoneal cavity. The rectum was divided above the growth, and its proximal end was grasped with forceps. The involved portion was then excised just above the external sphincter, the bowel drawn down and sutured to the healthy tissue which surrounded the anal orifice. A drainage-tube three-fourths of an inch in diameter was inserted into the rectum, and the vaginal incision closed with a continuous catgut suture. There was practically no shock and very little hemorrhage, the operation requiring but thirty minutes. On the fourth day the drainage-tube was removed. The patient left the hospital two weeks after the operation, the bowels being under perfect control.

A second case was operated by E. E. Montgomery. The disease in the rectum had produced an annular stricture which would not admit of the introduction of the finger. It was situated about one-half inch above the anus. A similar operation to the foregoing was performed, though it varied a little in its details.

The advantage claimed for vaginal section in the relief of cancer of the rectum is the preservation of the sacrum and the posterior bony walls. The anterior operation gives as extensive a field of operation as the posterior. In vaginal section the diseased tissues are easily exposed, and it is possible to make a higher section than in approaching the rectum from behind.

Anomalous Position of the Cæcum and Colon.—GRANT, W. L. *Northwestern Lancet*, vol. xxii, No. 9, p. 171, May 1, 1902.

The patient was operated on for obstruction of the bowels which had persisted for one week. He was in bad condition, the pulse varying from 130 to 140, and the extreme distention of the intestines rendered it difficult to ascertain the relation of the parts. A Murphy button was finally introduced between the nearest loop of small intestine and the part thought to be the descending colon. The patient did not rally from the operation. At the post-mortem

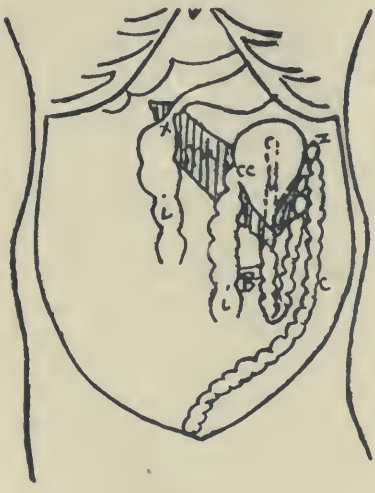


FIG. 1.

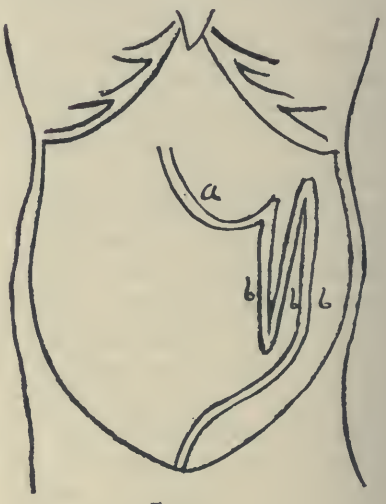


FIG. 2.

examination the right iliac fossa was found empty, the peritoneum passing smoothly over the back of the posterior abdominal wall from the pelvis to the diaphragm, there being no mesenteric attachments. The duodenum disappeared behind the peritoneum in its normal position. This was loosened and drawn forward and the small intestine traced downward, its mesenteric attachment (*a*, Fig. 2) being entirely on the left side. The distention began at the entrance of the common bile-duct, and extended beyond the cæcum. The

colon from the cæcum to the flexure in the right hypochondrium (Z, Fig. 1) was partially distended by gas, which was passed by the opening made by the Murphy button, while the descending colon, sigmoid, and rectum remained in complete collapse. The three divisions representing the ascending, transverse, and descending colon were found lying side by side in close proximity, and the cæcum pressed upon the flexure with sufficient force to prevent the discharge of gas. The anastomosis had not been made with the descending colon, as was thought at the time of operation, but with what took the place of the normal ascending colon. Consequently, had the patient survived the shock of the operation, the obstruction would not have been relieved.

The cause of the obstruction was an inflammatory mass of tuberculous origin in the mesentery, which extended from behind the junction of the cæcum and the colon, upward and inward toward the foramen of Winslow.

This anomalous position in this case is attributed to a failure of rotation. Left-sided cæcum is very rare, and this case was still more exceptional in having a left-sided colon as well.

The Statistics of Incarcerated Hernia.—Rothe, H. *Beiträge zür klinischen Chirurgie*, Band 33, Heft 1, p. 140, March, 1902.

In the last ten years 146 cases of incarcerated hernia have been treated in the surgical clinic of Breslau. Seventy-three of these were men and seventy-three women. The proportion of men who suffer from hernia as compared with women is four to one; hence incarceration is relatively more common in women. The difference is accounted for by the fact that small crural herniæ are most common in women, and incarceration is by far the most frequent in this form.

Taxis in the reduction of hernia is permitted in the Breslau clinic only in the first twenty-four hours, and then only in cases where efforts have not previously been made to replace the bowel. The only exception to these rules is in large inguinal hernias with a relatively large inguinal canal. We have no means of definitely learning the condition of the bowel before operation, but there is less risk from incision, with modern surgical technique, than in prolonged manipulation. The greatest danger from taxis is in the small crural hernia.

Various methods have been employed, the most of which have given good results: among these are compression with bags of sand or shot, the warm bath, an elevated pelvis, and complete anesthesia.

The gravity of the case depends on the time of incarceration; the average time of those reduced by taxis was twelve hours, those requiring operation fifty-five hours, and those which had become gangrenous averaged above seventy hours. The mortality is directly related to the time of incarceration, 11 per cent in those of twenty-four hours or less, and forty-eight per cent in cases of more than five days' standing. The mortality in women was relatively greater because of the larger number of crural hernias.

Acute Bone Atrophy Following Inflammation and Trauma.—SUDECK, P. *Deutsche Medicinische Wochenschrift*, 28th year, No. 19, p. 336, May 8, 1902.

The result of examination with the *x*-ray has convinced the writer that there is a trophoneurotic atrophy of the bones which accompanies trauma and inflammation of the extremities. The exact nature of the changes in these cases is not known, and is not revealed by the Roentgen ray; in some there is chemical change in the bone salts, while in others there is lacunar absorption. Such atrophy has been noted after injury and inflammation of the large joints, but it occurs even more frequently where the small joints of the feet and hands are involved. Commonly the process ends in recovery, but this does not always occur, there being more or less impairment of motion, pain, and stiffness as a permanent condition. Not infrequently with acute bone atrophy there is associated vasomotor disturbance of the skin with local redness and swelling. The diagnosis depends almost wholly on the interpretation of the findings with the *x*-ray, though the clinical grouping of vasomotor changes with progressive impairment of the joints should lead to the suspicion of bone atrophy. The treatment consists of early immobilization to meet the indications attending the original injury. Rest should not be continued too long, and even while the acute process continues the joints should be moved. Later massage with heat should be energetically employed.

The Treatment of Septic Peritonitis.—WETHERILL, H. G. *Journal of the American Medical Association*, vol. xxxviii, No. 21, p. 1343, May 24, 1902.

Frequent reference has been made in MEDICINE to the discussion as to when to operate in appendicitis. On the one hand are the advocates of immediate surgical intervention in all cases, and on the other those who would temporize in a certain class of cases.

The paper of Wetherill is, to our mind, one of the most rational statements of the controversy that we have seen. In his summary

he says that the treatment of septic peritonitis by surgical or medical means must be determined in each case by a carefully made differential diagnosis as to the source of the infection; secondly, by an estimate of the apparent virulence and diffusion of the infection; and thirdly, the time that has elapsed since the infecting material obtained entrance into the peritoneal cavity. Infections from the intestines, appendix, and oviduct are dangerous in the order given. This is due to the relative greater mobility of the first, the second and third favoring a relatively less extensive distribution of their contents. Physiological rest of the intestines favors limitation of the peritoneal involvement. This is best attained by keeping the bowels empty and avoiding cathartics. Lavage and enemata may be necessary; the latter should be small in amount and but little force employed in introducing the fluid. Cases of diffuse peritonitis with profound local and general symptoms must be regarded as inoperable, as better results are obtained by simpler and safer measures. Early operation before diffusion has taken place is in most instances to be advised. Interval operations are advisable after recovery from a diffuse peritonitis from any source.

Resection of the Cervical Sympathetic in Glaucoma.—MARPLE, W. B. *Medical Record*, vol. lxi, No. 19, p. 729, May 10, 1902.

Out of a total of seventy patients operated on, the writer is able to construct a table giving the results. The cases are divided into two groups: those that have been observed for one year or more, and those for less than a year. On the whole, the results are not very encouraging. Improvement and subsequent relapse was noted in twenty cases; improved, eighteen cases; improvement limited to relief of pain or diminution of tension, sixteen cases; unchanged, fifteen; worse, one. The very unfavorable prognosis in glaucoma the writer thinks encourages a further use of the operation. While the published cases do not admit of a positive conclusion as to its possible permanent effects, it is unquestioned that in some cases improvement lasting for months has followed. It will not replace iridectomy, but may supplement the latter.

Fat in the Sputum and Urine, After a Fracture.—SOUTHAM, F. A. *Lancet*, vol. clxii, No. 18 of vol. i, p. 1240, May 3, 1902.

The case of a man 43 years of age, who had sustained a compound fracture of the right tibia, is reported. There was little comminution of the bones. A small punctured wound was found at the site of the fracture. An antiseptic dressing was applied with a posterior

splint. On the following morning the patient was drowsy and the temperature was 100.4° F. On the third day after the injury the drowsiness had increased so that he was with difficulty roused. When roused he quickly became somnolent. There was some bloody sputum expectorated, and on the fourth day a number of minute globules were noted floating on the urine. A microscopic examination showed that they consisted entirely of fat. Six days after the fracture an examination of the bloody sputum showed fat globules mixed with the blood cells. Evidences of consolidation were found at the base of the right lung. There was no dyspnea or other signs of pulmonary obstruction. From about the sixth day the patient improved, the lung clearing, and expectoration becoming free from blood, together with the disappearance of the fat from the sputum and urine.

THERAPEUTICS.

Alcohol as an Antidote for Carbolic Acid.—WALLACE, G. B. *New York University Bulletin of the Medical Sciences*, vol. ii, No. 2, p. 58, April, 1902.

The results obtained in treating carbolic acid ingestion by alcohol are variable, and are not explainable on the theory of a chemical antidoting of the carbolic acid by alcohol. Persons suffering from carbolic acid poisoning often show most alarming symptoms, and yet recover with very little treatment. In the cases so far reported of recovery after carbolic acid poisoning in which alcohol was administered, it cannot be definitely stated that the amount of carbolic acid absorbed was a fatal dose. In studying the effect of carbolic acid upon the skin, 95-per-cent alcohol was employed. If the alcohol is employed immediately after the carbolic acid, the latter has no effect. After an interval of two minutes the effects are also practically removed, though a slight reddening of the skin remains. After five minutes the white area produced by the phenol is removed with great difficulty; a deep-red color remains, the skin is hard and dry and somewhat sensitive, and the redness persists for several days. These results show that in order to remove completely the local effects of carbolic acid, the alcohol must quickly follow the acid.

If instead of pure carbolic acid a mixture of alcohol and acid be employed, the escharotic action of the acid is the more marked. The effects of this mixture of alcohol and carbolic acid are less inhibited by subsequent alcohol washings than where phenol alone is used.

The simplest interpretation of this result was that alcohol checks the action of the carbolic acid because it is a good solvent of the latter. When carbolic acid in sufficient concentration comes in contact with a proteid, whether in a test-tube or in a cell, it causes a precipitation of the albumin. The precipitate is not a firm combination of phenol and protein, and is due to a change in the nature of the solvent by which the proteid is surrounded. If carbolic acid is allowed to remain but a short time in contact with the skin, it penetrates to a slight extent only. When the part is thoroughly washed with alcohol, which is an excellent solvent of phenol, the latter is removed and further action checked. If before the alcohol is applied the phenol has had time to penetrate deeply into the tissues, the alcohol has little effect. Other solvents, such as benzol, chloroform, and ether, act in the same way as alcohol in overcoming the local effects of carbolic acid. They are not as efficient because they are not such good solvents of the acid. Alcohol neutralizes the local escharotic effect of carbolic acid because of its solvent action, which aids in the removal of the acid from the skin or mucous membranes. Its antidotal action is purely local, since after the acid has been absorbed it has no power to overcome its poisonous effects.

Roentgen-ray Treatment.—PUSEY, W. A. *Journal of the American Medical Association*, vol. xxxviii, No. 15, p. 911, April 12, 1902.

Six cases of tuberculosis of the skin were treated by the *x*-rays. In three of these the diagnosis of lupus was fully established, and the result was as good as can ever be expected by any method. There was no destruction of healthy tissue in getting rid of the disease, and there could not have been less scarring after destruction as extensive as had taken place in these cases. The scars left were white and pliable. The cases were well eighteen, twelve, and six months respectively after the treatment was discontinued.

Seven cases of epithelioma were reported, in all of which the treatment was a success. While the time which has elapsed since the termination of the treatment is too short to say positively that there will be no recurrence, yet there is every reason to believe that should such take place the treatment will control the disease. One of the cases was very far advanced, the ulcer extending deeply into the orbit. In this case all trace of the disease has disappeared, the site of the ulcer being covered with healthy skin.

The author has great confidence in this method in the treat-

ment of epitheliomas, having had no case so far that has failed to yield promptly to the application of the rays. The scars that remain are free from induration and have the quality of normal skin. Three cases of carcinoma of the breast were treated in which the results were favorable, and three in which there was no improvement in the local trouble. Two of the latter were under treatment less than six weeks, so that the method did not have a fair trial.

In the treatment of carcinomas of the abdominal cavity the *x*-rays relieved pain, but no retarding of the progress of malignant disease was noted. In sarcoma, keloid, and pseudoleukemia the *x*-rays have been employed with success in some cases.

He is unable to report an unbroken series of successful cases, but believes that the results so far achieved justify persistence in the treatment. With the exception of a few epitheliomas, all of his cases had been passed upon as hopeless by competent medical men. A more unpromising group of cases could hardly be imagined. In the microscopic sections which have been made in a few of the cases in morbid growths before and after treatment, it is shown that the *x*-ray causes a degeneration of carcinomatous tissue, which is followed by the formation of healthy scar tissue. A similar process occurs in tuberculosis, sarcoma, and pseudoleukemia.

Hyoscine in the Treatment of Paralysis Agitans.—Bury, J. S. *Lancet*, vol. clxii, No. 16 of vol. i, p. 1097, April 19, 1902.

Two cases of paralysis agitans in which the administration of hyoscine afforded considerable relief are reported. The patients were brother and sister; in one the disease began in the fourth decade, and in the other at 18. In the case of the brother the disease began by a shaking of the legs, and later the tremor involved the head. In the case of the sister the tremor came on gradually, so that she could not be sure at what period it actually began, but at the age of 19 it became so severe that she had to give up her employment. Both patients presented the characteristic mask-like face and other symptoms of paralysis agitans at the time they were admitted to hospital. In both the tremor affected the hands and forearms and feet, and to a slight degree the head. The tremor was more marked in the hands than in other parts, and could be controlled by voluntary effort. It was absent during sleep. The muscular stiffness was not marked, nor was the rigidity of the limbs at all pronounced.

The patients were treated by massage and by the administration

of hyoscine. The drug was given hypodermically, the dose being gradually increased from $\frac{1}{250}$ to $\frac{1}{120}$ of a grain, which was injected twice a day; subsequently the dose was given by the stomach in chloroform water, $\frac{1}{150}$ of a grain, twice daily. This was gradually increased until a dose of $\frac{1}{96}$ of a grain was reached. Both patients took this amount without ill effect, and while under the action of the drug were much better, more comfortable, and less troubled than formerly with flushings and restlessness.

Experience in these cases shows that hyoscine is one of the most useful drugs in this affection. It is a powerful drug and must be given with care. A useful prescription is one-eighth grain of hyoscine hydrobromate and six ounces of chloroform water. At first two teaspoonfuls of this may be given, and then three, four, or five teaspoonfuls; if necessary, the dose may be increased to six teaspoonfuls, which would amount to $\frac{1}{64}$ of a grain. It is best given in the morning directly after breakfast, and then in the evening, before going to bed.

Acetozone in the Treatment of Typhoid Fever.—WASDIN, E. *Therapeutic Gazette*, vol. xxvi, No. 5, p. 289, May 15, 1902.

The writer reports twenty-five cases of typhoid fever treated with this new intestinal antiseptic. The duration of the disease was reduced in a large number of them to fourteen days, the time being reckoned from the development of definite symptoms. This series of cases was remarkably free from bowel complications, and where they were present, in those admitted after the disorder had persisted for some time, they quickly disappeared. There were no deaths and but few terminal expressions of the infection.

The treatment pursued in all the cases was to thoroughly move the bowels by grain doses of calomel combined with aloin and guaiacol every two hours until the intestinal canal was emptied. The patient was then given from 1500 to 2000 cubic centimeters of a solution of acetozone that had been prepared twenty-four hours before. The diet was restricted to milk to which was added acetozone. In addition the same substance was atomized and inhaled. In some cases the acetozone was given in capsule, five grains in sugar of milk, three times daily.

The first effect of the acetozone is an increased secretion of the kidneys. This is soon followed by a pronounced decrease of the odor of the stools and a marked diminution of the microörganisms found in the intestinal dejecta. As a result of his observations, the writer concludes that acetozone is an efficient germicide that is

innocuous to man and is readily eliminated. In the treatment of typhoid fever it will destroy the source of the infection if brought in contact with it. In typhoid it obviates the intestinal infection and toxemia, preventing the development of complications and lessening the duration of the disease.

The Topical Application of Mucin in the Nose, Throat, and Ear.—STUART-LOW, WILLIAM. *Lancet*, vol. clxii, No. 14 of vol. i, p. 961, April 5, 1902.

The difficulty in nose and throat practice of overcoming the symptoms of atrophic rhinitis has led the writer to use mucin as a topical application. The lessened flow of mucus in these cases causes the impairment of the nasal functions with the formation of crusts and consequent ulceration, hemorrhage, and pain. He contends that in mucin we have a natural remedy which restores the moisture. This substance, when applied locally to the interior of the nose and pharynx, has a soothing and emollient action; it facilitates the removal of crusts and prevents their reformation, and obviates the fetor, which is one of its best points as a local remedy.

Messrs. Burroughs, Wellcome & Co. have prepared a tablet containing five grains of mucin, five grains of bicarbonate of sodium, and one grain menthol. It is used by dissolving in one ounce of sterilized warm water, as a spray, douche, or injection, twice daily.

At present the writer has ten cases of dry catarrh of the middle ear, with narrowing of the Eustachian tubes, and with varying degrees of deafness and tinnitus, under treatment. He injects twice a week a few drops of the solution, prepared as above, into the Eustachian tubes. None of the cases have been sufficiently long under treatment to state what the ultimate outcome will be, but in many the subjective improvement was encouraging, considering the intractable nature of the disorder. Patients who have suffered for years from typical atrophic rhinitis, with all its discomforts, have, after continuous application of the mucin irrigation, been able to live in comfort by using the remedy two or three times a week.

Culture Products in the Treatment of Tuberculosis.—POTTENGER, F. M. *Journal of Tuberculosis*, vol. 4, No. 2, p. 140, April, 1902.

The writer is of the opinion that culture products in the treatment of tuberculosis have not received the attention they deserve, because of a misconception of what should be expected of such remedies. Antitoxin is recognized as curative in diphtheria, yet it has its limitations, and to be useful it must be administered early. In the case of tuberculosis, the profession has not been satisfied with a

remedy of limited value; it has demanded that such a treatment should cure tuberculosis at all stages, and has not been content with a standard of efficiency readily accorded other remedies. Abundant experience in the use of culture products has shown that they favorably influence the tuberculous process, particularly before secondary mixed infection has occurred. The early unfortunate experience with tuberculin should not limit the use of these products, but should teach that they can be employed in too large doses and too often repeated, or in unsuitable cases. Experience shows that with care in the selection of cases they can be administered without harm to the patient. On the other hand, those who rely upon culture products in this disease should not relax their energies in other lines — the hygienic, climatic, and dietetic treatment should be used in connection with the culture products. The statistics show that where cases are managed properly and culture products are used, the proportion of cures is greater than when culture products are omitted. When given, these substances produce an immunity which protects the patient from relapses, and hence a permanent cure is more often reached than by hygienic or climatic treatment alone.

Adrenalin in Maxillary Antral Suppuration.—LINN, E. *American Medicine*, vol. iii, No. 16, p. 652, April 19, 1902.

The writer gives an account of acute involvement of the antrum, in which relief was obtained by the early administration of adrenalin. The patient, twenty-four hours after a severe exposure, was taken with a pain in the face which was diagnosed as neuralgia. No relief being obtained from domestic remedies, he consulted the writer. At the time he was suffering from pain, photophobia, and chemosis. Transillumination confirmed the diagnosis of antral trouble. There was no discharge from the middle meatus, nor did pressure cause any to appear. There was moderate chronic hypertrophic rhinitis. A large pledget of absorbent cotton was saturated with a solution of adrenalin chloride 1 to 1000 and placed in the middle meatus. At the end of two minutes this was removed, and the patient was directed to hold his head downward and to the opposite side. This maneuver was followed by the discharge of one and a half drachms of mucopurulent material from the nostril. A second examination with the electric light in the mouth showed a partial restoration of the transparency of the tissues. He was given a mild alkaline wash and a solution of adrenalin 1 to 10,000, which was to be used in the nostril every three hours, with directions to

frequently assume a posture that would favor drainage. Two further treatments at the office, and the home treatment carried out for five days, brought about a complete restoration, although complete transparency of the affected side of the face was not restored for a period of one month.

The Abortive Treatment of Carbuncle by Subcutaneous Disinfection.—BIDDER, A. *Deutsche Medicinische Wochenschrift*, 28th year, Nos. 18 and 19, pp. 320 and 338, May 1–8, 1902.

The author has employed this method of treating carbuncle for a number of years. Some time since he published the procedure, and since then two surgeons have confirmed his results. He claims that in all cases the infection is aborted, and further operative procedures are unnecessary.

Two-per-cent carbolic acid solution is employed. The injection is made with an ordinary hypodermic syringe, using a good-sized needle. The needle is entered at an angle of about 45 degrees, and is so placed as to be about midway between the softened area in the center and the indurated margin. It is carried to the center of the infection just below the skin. In some cases a fistula leads to the suppurating focus, this marking the center of the carbuncle. One-half the contents of the syringe is injected, when the needle is withdrawn and again entered on the opposite side in the same manner. The remaining contents of the syringe when thrown into the already distended tissues commonly escapes along the track of the previous puncture, or the fistula if one exists.

The injection is usually followed by some pain and a slight increase in the swelling. In a few days the carbuncle shrinks to a small indurated mass, which soon disappears.

A number of case histories are given, which show that there is a true aborting of the infection. The author offers some speculations on the mechanism of the process.

The Treatment of Venereal Ulcer by Cold.—BRANDWEINER, A. *Wiener Klinische Wochenschrift*, 15th year, No. 17, p. 439, April 24, 1902.

In 1892 Welander referred to a method of treating venereal ulcers by warm water, and Ullmann brought out his hot-air treatment. Both methods require complicated apparatus, and because of the length of the applications are of little clinical value. By the application of cold it is possible to reach similar results.

Forty cases of venereal ulcer have been treated with chlor-ethyl or methyl, or mixtures of the two. The results were substantially the same, whichever freezing mixture was employed. Before the

application the ulcer is cleaned as thoroughly as possible with an antiseptic solution, and its surface is stretched so as to expose all of the folds. It is then carefully dried, and the freezing mixture applied in the same manner as it is used when performing local anesthesia. In from three to five minutes the ulcer and the surrounding parts are thoroughly frozen.

The results on the whole were satisfactory, fully equal to those obtained by the continued action of heat. The simplicity of the method commends it. It is probable that the action of the cold is substantially the same as that of heat.

Diphtheria of the Conjunctiva Treated by Antitoxin. — HOLT, L. E. *Archives of Pediatrics*, 19th year, No. 5, p. 349, May, 1902.

The patient, an infant six months old, was admitted to hospital with a marked redness of the right eye and swelling of the upper lid. A thick, yellowish-gray patch of pseudomembrane was found upon the conjunctiva covering about one-half of the lid. The conjunctivitis was marked and the cornea slightly cloudy. There was no membrane in the throat or elsewhere, and the general symptoms were those of moderate prostration. The temperature was 102°. A fresh smear, and eventually a culture, showed diphtheria bacilli abundantly present. Antitoxin was administered, and in twenty-four hours the temperature had fallen to 100.8° F. In forty-eight hours after the administration of the antitoxin there was a decided improvement, the swelling lessened, and on the sixth day had disappeared. In cultures the diphtheria bacillus was found as late as the seventh day.

An Experimental Study of the Urinary Antiseptics.—SACHS, O. *Wiener Klinische Wochenschrift*, 15th year, No. 17, p. 442, April 24, 1902.

The writer has made a comparative study of the different antiseptics which are given internally for the purpose of rendering the urinary tract sterile. Some of these experiments were directed to ascertain the effect of the different substances upon urine which contained bacteria, or when the bacteria were added to urine which was aseptic. Of all the urinary antiseptics, urotropin was found to be the most efficient. In doses of sixty grains daily, the urine had a distinct antiseptic action upon microörganisms, whether contained in the bladder or added to the urine. Next to urotropin, salicylic acid was the most efficient. Sandalwood oil, methylene blue, salol, balsam of copaiba, camphoric acid, and oil of turpentine in large doses, all had a distinct antiseptic action. Chloride of potassium, boric acid, and uva ursi had no appreciable action.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

The Etiology of Hodgkin's Disease.—Dolson, J. M. *Pediatrics*, vol. xiii, No. 8, p. 284, April 15, 1902.

A history of a boy three and a half years old is given. The patient, born of healthy parents, was of normal weight and height and had always been well until three months before coming under observation, at which time a swelling was noted on the right side of the neck. It increased rapidly, and soon the left side of the neck was involved. There was no pain, no loss of appetite, no emaciation or fever, or deterioration of the general health.

The boy was well nourished, presenting no abnormality excepting the increased size of the neck, which was due to enlargement of the superficial glands, they varying in size from a large filbert to a hen's egg. The skin was movable over the glands, and they were movable upon each other. One or two of the enlargements were moderately hard, most of them were distinctly soft and elastic; the largest, situated below the angle of the jaw on the right side, on palpation seemed to fluctuate. There was no tenderness, even on firm pressure. There was no pressure upon the structures of the neck, and no enlargement of the axillary, inguinal, or abdominal glands. There was slight anemia. A differential count showed a slight increase of lymphocytes, but not more than is found in children during digestion. There was at no time pronounced leucocytosis. A tuberculin injection gave no reaction. A small gland was removed, which showed none of the usual appearances of a tubercular process, and careful staining revealed no bacilli. The patient was placed upon Fowler's solution in increasing doses, which was followed by a notable diminution in the size of the glands.

Hodgkin's disease is probably of infectious origin, but the nature of the infection is still unknown. Cases of tubercular and syphilitic disease of the lymphatics may simulate it, and have often been mistaken therefor. The case under consideration was unquestionably one of Hodgkin's disease, as tubercular and syphilitic disease were excluded and there was no local cause for the enlargement of the glands.

Hepatic Lesions in Infancy.—Wollstein, N. *American Journal of the Medical Sciences*, vol. cxxiii, No. 5, p. 817, May, 1902.

The liver observed in 370 consecutive autopsies of infants ranging in age from two days to four years furnishes the material from which the author makes certain deductions. Fatty liver was found

in 133, and of these thirty-six were extremely so. Of the fatty livers, 48 per cent occurred in emaciated infants, and 30 per cent in those fairly nourished, and 22 per cent in well nourished infants. Of the extremely fatty livers 39 per cent occurred in well nourished children, and it was noted that a very high degree of fatty infiltration was more common in well nourished subjects, and an ordinary degree of fatty change was more frequent in emaciated cases. A study of the condition of the liver in reference to the cause of death shows that fatty change occurred most frequently with suppurative inflammations. Next in order of frequency came tuberculosis, anemia, and the intestinal diseases. It was never found in uncomcomplicated marasmus, and was inconstant both in syphilis and rachitis. Neither disease seemed to cause a predisposition to fatty infiltration of the liver.

One case of hypertrophic cirrhosis was found. It occurred in a syphilitic infant three months old. There was no icterus at any time. The liver weighed 205 grammes. The decided increase in connective tissue was made up partly of cellular and partly of old fibrous structures. The liver cells were granular, and in places had undergone pressure atrophy. The spleen weighed 150 grammes, was firm, the capsule showing a chronic perisplenitis.

An Improved Method of Examining the Bladder in Women.—WEBSTER, J. C. *Journal of the American Medical Association*, vol. xxxviii, No. 20, p. 1299, May 17, 1902.

In Kelly's method of examining the bladder, the genupectoral position is assumed, or pillows are placed under the hips of the patient while she is upon her back. Both of these methods have certain disadvantages. The elevation of the hips by pads frequently flexes the abdomen on itself, so that the ascent of the intestines toward the diaphragm is prevented and the ballooning of the bladder does not take place. The genupectoral position is favorable to the bladder distention, but is unpleasant to the patient unless an anesthetic is used. While the patient is unconscious the procedure is awkwardly carried out.

During the past three years the writer has employed a method which is free from these objections. The patient is placed on a Boldt operating table in the lithotomy position, the ankles being fastened to upright rods, the buttocks projecting slightly over the end of the table, resting on a rubber pad; there is a steel bar with two padded supports for the shoulders. After the patient is prepared the urethra is dilated and a speculum with an obturator is

introduced into the urethra; the top of the table is turned on its transverse axis, elevating the lower end. The patient then rests on an inclined plane, being held by the shoulder supports, the trunk being flat upon the table. An elevation of about twenty-three inches will fully distend the bladder when the obturator is removed from the speculum. The posture has all the advantages of the genupectoral position and none of its disadvantages. In the examination of the rectum the position is highly satisfactory, air distention being obtained in the majority of cases.

Suprarenal Gland in Pruritus of the Vulva.—MEARA, F. S. *Merck's Archives*, vol. iv, No, 5, p. 177, May, 1902.

Two cases of pudendal irritation with marked pruritus are described. One, a young woman 18 years of age, ten days before coming under observation, was seized with a violent itching of the vulva and anus. Notwithstanding approved treatment there was no relief, and in the meantime the condition had become so severe that she was unable to leave the house. A local examination showed an intensely congested condition of the vulva and the lower part of the vagina, with increased secretion. A strong solution of suprarenal was applied to the part, which was followed by a rapid blanching of the mucous membrane. Momentarily the itching was increased, and then gave way to a slight burning sensation, which passed off in a few minutes. The effects of this application lasted for fourteen hours, when the itching recurred. A second application gave permanent relief.

Laceration of the Cervix a Cause of Abortion.—ROGERS, R. W. *Montreal Medical Journal*, vol. xxxi, No. 4, p. 277, April, 1902.

The experience of the writer confirms him in the belief that lacerations of the cervix, particularly those which are of some depth, are a frequent cause of abortion. A primipara can usually give some cause for an abortion, such as a misstep or a fall, but in those who have previously borne children, where there is a fissure extending as high as the internal os that will admit the tip of the index-finger, or the integrity of the lower uterine segments is lost, there is a predisposition to abortion.

Movable Kidney in Infants.—DUPOUX, J. *Thèse de Paris*, 1902.

The writer has studied the mobility of the kidneys in children and regards it as a stigma of degeneracy. The displacement may be congenital, and is dependent upon feebleness and relaxation of the ligaments. As in adults, mobility of the kidneys occurs most fre-

quently in girls and upon the right side. For the most part mobility of the kidneys in children is not observed because it is not systematically looked for. It is a frequent complication of dyspepsia and colitis, to which it gives a markedly painful character. Sometimes the mobility of the kidney is latent, and again it is characterized by local symptoms and sometimes acute crises which resemble peritonitis or appendicitis. The diagnosis is established by bimanual palpation, which displaces the movable kidney into the cavity of the abdomen. In children this condition rarely calls for operation, the application of a bandage being sufficient to retain the kidney in its place. Occasionally hydronephrosis may require surgical intervention.

FORENSIC MEDICINE.

Atropine Poisoning with High Temperature.—BEEHLER, L. L. *Journal of the American Medical Association*, vol. xxxviii, No. 17, p. 1081, April 26, 1902.

A case of atropine poisoning is described in which recovery took place after a remarkably large dose, and which was accompanied by a rise of temperature. The patient, who was a neurasthenic verging upon melancholia, took a solution containing three grains of atropine, a mixture that had been given her for the purpose of dilating the pupils precedent to an examination of the refraction. The patient was seen in less than twenty minutes after taking the drug, and strychnine, one-fortieth grain, was given hypodermically and repeated in fifteen minutes. The pulse was very small. One-tenth of a grain of apomorphine, repeated in fifteen minutes, was not followed by vomiting. Thirty minutes later one-eighth grain of apomorphine was given, but there was no vomiting. An effort was made to pass the stomach-tube, but it could not be gotten beyond the pharynx. Pilocarpine failed to produce any effect and was discarded early in the case. The pulse was 160 shortly after taking the drug, and one hour later the axillary temperature was 105°. Fifty minutes later it had reached 106°, the pulse remaining the same. At this time a peculiar red rash appeared on the chest, and one hour later the temperature dropped to 103.5°, and the pulse to 150. The catheter was passed, and four ounces of urine of a specific gravity of 1.106, containing a small amount of albumin, drawn. The atropine was found in the urine, which was withdrawn four hours after ingestion. One drop of this urine in the

eye of a cat produced dilatation in five minutes. Some five hours after taking the drug the axillary temperature had fallen to 105.8°, and by the following morning the temperature was normal, the pulse 108, and the respirations 24.

Poisoning by Aconite.—MAGILL, W. S. *Medical News*, vol. lxxx, No. 22, p. 1019, May 31, 1902.

Cases of criminal poisoning by aconite are rare. The case reported by Magill is known as the Condon case, of Springfield, Massachusetts. The defendant in this case purchased a two-ounce bottle of tincture of aconite, one-half of which was placed in a pint bottle of port wine and sent to the person whose life was attempted. The pint of wine reached its intended victim so late in the evening that it was put by, but the following morning nearly one-half of the wine was drunk. The immediate effect was a dizziness, inability to move, and a peculiar creeping sensation in the muscles. The vision became obscure. Assistance arriving, life was only saved by three hours of most untiring efforts.

The chemical examination of the suspected liquid showed an alkaloid which was identified as aconitine. An effort was made to quantitatively determine the toxicity of the recovered alkaloid by a system of physiological analysis. For this purpose intravenous injection was employed with increasing proportions of the suspected substance, noting the effect on the pulse, blood-pressure, and respiration. These effects were carefully compared with a standard solution of the same drug. When the tabulated curves exactly coincide, the dose of the poison can easily be determined. The writer insists upon the value of this physiologic analysis, which is said to be a method of great precision in determining minute quantities of powerful poisons. In addition, it is a valuable method of identifying alkaloids, and permits of the identification of each poison where mixed alkaloids are given.

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

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I.

II.

FIG. 6.—Monkey A45007. Infected by feeding culture of tubercle bacillus BB., isolated from mesenteric gland of child. I, Intestines; II, Lungs. (See page 624.)

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ORIGINAL ARTICLES.

THE INTERCOMMUNICABILITY OF HUMAN AND BOVINE TUBERCULOSIS.*

BY MAZŸCK P. RAVENEL, M.D.,
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[From the Laboratory of the State Live-stock Sanitary Board of Pennsylvania.]

(*Continued from page 546.*)

Accidental Inoculation of Man with the Bovine Tubercle Bacillus.—While we cannot determine the virulence of the bovine tubercle bacillus for man by direct inoculation, we are, nevertheless, not without some information on this point, owing to the accidental inoculations observed from time to time. Four such cases have been reported to this society, accompanied in three instances by the exhibition of the specimens.[30]

Similar cases have been reported by Tscherning[31] and Pfeiffer,[32] the latter ending in general infection and death.

Dr. M. B. Hartzell[33] has also observed two cases in which the bovine origin of the infection was not absolutely proven, though certainly highly probable, both occurring in healthy men who were employed by one of our large railways to clean and repair cattle cars. In both a well marked tuberculosis of the skin of the verrucous type followed slight wounds of the back of the hand inflicted by broken timbers. One man recovered under local treatment, but the other died after about a year through involvement of the lungs and other organs. This patient was a robust man, aged 44 years, weighing 175 pounds, with good personal and family histories. Dr. Hartzell felt that he was able to exclude with reasonable certainty

*An address delivered at the Annual Conversational Meeting of the Pathological Society of Philadelphia, on Thursday evening, April 24, 1902, with omission of certain details.

any other source of infection. The death of Mr. Thomas Wally, Principal of the Royal Veterinary College of Edinburgh, is also attributed to infection gaining entrance through a wound received while making an autopsy on a tuberculous cow.

The interest which has been aroused by Professor Koch's paper has brought out numerous reports of such cases, which are now being published to show that man has something to fear from bovine tuberculosis.

Dr. Kurt Mueller,[34] a surgeon of Erfurt, describes the cases of two healthy young men who were under his care. Both were butchers, and in both cuts were sustained while working on tuberculous cattle, the wound opening the synovial sheath of a tendon in the hand. In each case an operation was necessary, and it was found that the walls of the sheath, as well as the tendon itself, were thickened, while upon them were large numbers of yellow nodules, proven to be tubercles by microscopical examination. These tubercles were placed very thickly near the scar, gradually becoming fewer as the scar was left. In one of the men the trouble extended from the finger to the forearm, and there was some evidence of tuberculosis even at the muscular attachment of the tendon. In the second case the tendon was attached to the sheath, and the disease limited to an area 10 centimeters in length. Examination of the removed tissue proved the presence of tubercle bacilli. Both of these men had good family histories, and were free from tuberculosis elsewhere, so that Dr. Mueller has no doubt that they were inoculated with bovine tubercle bacilli.

De Jong[13] observed the case of a man who injured his finger while examining the mesentery of a tuberculous cow. The wound did not heal, the edges became indurated, and considerable swelling ensued, with pain, which increased steadily and failed to yield to ordinary treatment. Curettage and cautery were finally used with success. In the scrapings tubercle bacilli were demonstrated.

In Berlin[35] two men who are employed in the slaughter-house to carry the condemned tuberculous meat to the place where it is destroyed have developed tuberculosis of the skin of the hands. At a recent meeting of the Medical Society of Berlin, Professor Lassar[36] presented cases of verrucous tuberculosis of the skin. He had observed this type of skin tuberculosis in butchers who had handled tuberculous meat. Of thirty-four cases seen by him four were in butchers; while on the contrary, among those affected with other forms of tuberculosis localized to the skin of the hands, none belonged to this calling. Liebreich agreed with the view taken,

and said that he had been able to assure himself that verrucous tuberculosis of the skin was much more common among those whose duties require handling tuberculous meats than among others. Blaschko spoke of the case of a cook seen by him in whom a tuberculous lesion followed the prick of a piece of bone.

It is interesting to note that Dr. Hartzell's two cases were both of the verrucous variety, the origin in both having been almost certainly bovine.

Drs. Joseph and Trautmann[37] report three cases of verrucous tuberculosis of the skin occurring among employees of the municipal abattoir in Berlin, who worked exclusively with tubercular animals.

Case 1.—J. G——, aged 45 years. Was never ill before, and no tuberculosis in his family. His duties were to cut up tubercular and condemned carcasses. In 1892 or 1893 he received a small wound of the middle finger of the left hand, and a nodule soon formed, surrounded by a zone of redness. It increased slowly until 1897 or 1898, when the thermocautery was resorted to with partial success. About a year ago the man tore the first finger of the same hand on a bone from a tubercular cow. The wound cicatrized in about eight days, but later a nodule developed on the site. When examined, in August, 1891, the disease was confined to the first and middle fingers of the left hand. On the first finger nodules about the size of a pea protruded from the surface one to two millimeters, moderately red, and having in the center a broken area covered with small crusts. The nodule on the middle finger was much larger and the verrucose condition more developed.

Case 2.—J. O——, aged 35. No history of tuberculosis in family. The patient, his wife, and three children had always been healthy. Has been employed in the abattoir for one year, and always in division reserved for tubercular animals. Three months before he had suffered a wound of two fingers, following which the disease developed. On the little finger is a hard, rough, thickened area, extending entirely through the skin. On one side is an ulcer which goes deep into the corium.

Case 3.—K. S——, aged 38 years. Employed in handling tubercular material. He showed a typical tuberculosis of the skin. As the case was being treated by another physician the details are not given.

It would seem that instances of infection through wounds are not as uncommon as has been supposed heretofore. Their value has been questioned on the ground that inoculations do not always correspond to natural infections. I do not pretend that such cases settle the whole question definitely, but they do prove beyond question that there is no peculiar quality in the tissues of man which makes him an unfit soil for the bovine tubercle bacillus. Furthermore, they afford us means of comparison with similar cases in which the invading organism is of human origin, wounds of the hand while operating on tuberculous cadavers, or in cleaning cuspi-

dors used by phthisical persons, being not uncommon. I have been at some pains to study the reports of such infections, and feel bound to conclude that the bovine bacillus is at least as virulent as the human for man when introduced in such manner. We know from experimental as well as clinical evidence that the skin is the tissue most unfavorable to the growth of the tubercle bacillus. If, then, the bovine bacillus can successfully invade the skin and multiply there, with the production of characteristic changes, it seems we are fully justified in believing that organs and tissues that are known to offer favorable soil to the human bacillus will also prove favorable to the bovine organism. On the other hand, I know of no animal which is susceptible to the human bacillus yet immune to the bovine. Birds are equally refractory to both, a small proportion of those inoculated or fed with either succumbing to tuberculosis.

Tubercular Infection Through Food.—Koch bases his opinion as to the non-transmissibility of bovine tuberculosis to man largely on the alleged rarity of primary intestinal tuberculosis. He says: "If the bacilli of bovine tuberculosis were able to infect human beings many cases of tuberculosis caused by the consumption of aliments containing tubercle bacilli could not but occur among the inhabitants of great cities, especially children. That a case of tuberculosis has been caused by aliments can be assumed with certainty only when the intestine suffers first—*i.e.*, when a so-called primary tuberculosis of the intestine is found." He says that he has seen only two such cases; that at the Charité Hospital in Berlin only ten cases were seen in five years; that among 933 cases of tuberculosis in children at the Emperor and Empress Frederick's Hospital for Children, Baginsky never found tuberculosis of the intestine without simultaneous disease of the lungs and bronchial glands; that Biedert found only sixteen cases of primary intestinal tuberculosis among 3104 children examined post mortem.

The assumption that the proportion of tuberculosis caused by food is correctly revealed by the lesions of the intestine or mesenteric glands is certainly erroneous, and leaves out of consideration entirely at least one very important avenue of infection.

Infection Through the Tonsils.—The numerous observations made of late years leave no doubt that the tonsils sometimes act as the port of entry for the tubercle bacillus. As well put by Baup,[38] "discussion is only possible as to the greater or less frequency of these lesions, and their pathological importance," a position sustained not only by the work of other observers but by his own, in which he examined the tonsils from those cases only in which tuber-

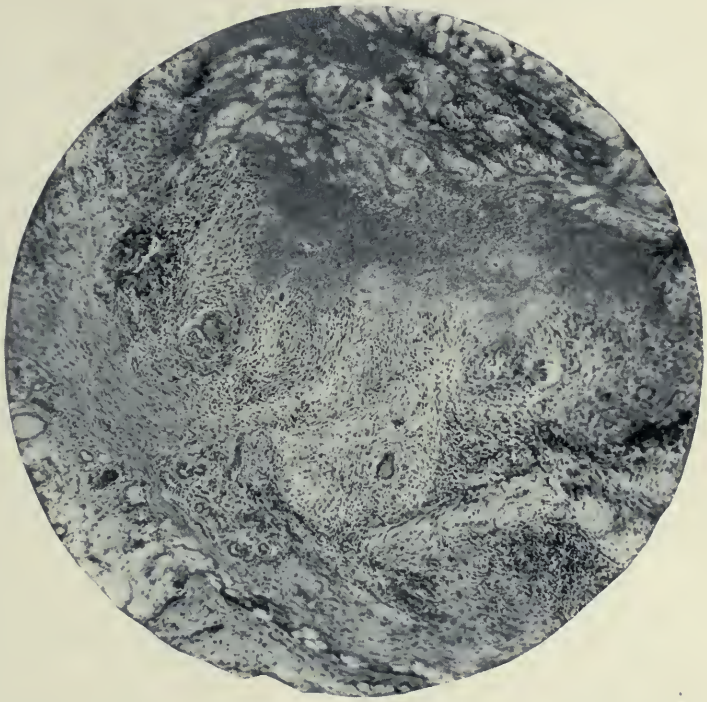


FIG. 7.—Section from nodule of skin of man produced by accidental inoculation with the bovine tubercle bacillus. Sections stained with carbol-fuchsin show many tubercle bacilli.

FIG. 8.—Pig 26264. Inoculated by feeding a pure culture of tubercle bacillus of human origin. The tonsils are ulcerated and necrotic, the lungs studded with nodules throughout, the intestines free from disease.

culosis of the lungs was absent and other ports of entry could be excluded. Dieulafoy,[39] by the inoculation of guinea-pigs, found tuberculosis in fifteen of ninety-six cases. Latham,[43] who was careful to employ only the interior portions of the tonsils, in forty-five consecutive cases of children from three months to thirteen years of age, seen at autopsy, found seven which were tuberculous. One of the most recent studies of this subject is that of Friedmann,[40] who examined the tonsils obtained from ninety-one children at autopsy, and fifty-four cases removed by operation, all but one of the latter under five years of age. Of the ninety-one cases, in three there was tuberculosis, probably not primary; in five there was tuberculosis, probably primary, with secondary involvement of lymphatic glands, intestine, and bone; in one the tonsils showed many tubercles, giant cells, and tubercle bacilli, the rest of the body being free; in seven (two with and five without tuberculosis in other parts of the body) the tonsils contained typical giant cells, but no bacilli could be demonstrated; in three, giant cells attributed to other causes were found; in eleven, which showed extensive tuberculosis of other parts of the body, the tonsils were free, but showed scars; in four the tonsils were free, there being tuberculosis of the internal organs; in three bacilli were demonstrated in smear preparations, though no tubercles were found. In the remaining fifty-four cases, tuberculosis was not found in any part of the body. Only one of the operative cases showed primary tuberculosis.

When we remember the frequency with which children are fed, and the ease with which particles of food lodge in the tonsils, we cannot but think that Friedmann is reasonable in his conclusion that tuberculosis of the tonsils is quite common in children, and that the infection takes place directly from food, and not through the lymph, blood, nor by inhalation.

Numerous authors who have studied this question give corroborative facts, lack of time preventing further citations. Those given are sufficient, I think, to show the fallacy of looking exclusively to the intestine for the proof of a food infection. I beg to call attention to the specimen showing ulceration of the tonsils which I have here, taken from one of four pigs which were infected by feeding, ten meals containing pure cultures of tubercle bacilli being given (Fig. 8). All the animals contracted general tuberculosis, most marked in the lungs, and ending in death. Three of the four presented lesions of the tonsils similar to those shown, while in only one could any lesion of the intestine be found. In the tonsils of the fourth pig, which showed no macroscopical lesions, many tubercle

bacilli and areas of caseation were found. In three of the four pigs the cervical and mediastinal glands were markedly involved, and tubercle bacilli were readily demonstrated in smear preparations made from the cut surface of the salivary glands in the remaining one.

A similar observation was made by Koch, who, however, seems to have entirely overlooked the importance of it. He says: "These animals had without exception severe tubercular disease, especially tuberculous infiltration of the greatly enlarged glands of the neck and of the mesenteric glands, and also extensive tuberculosis of the lungs and spleen."

Clinical Observation. — The number of cases in which infection can be traced to the consumption of tuberculous milk is not large, and almost all of them are open to some criticism from the fact that all other sources of infection cannot be positively excluded. From the nature of the case this will always be true, and we can never shut children up and feed them with tuberculous milk in the way of an experiment. However, evidence in some of the cases is so clear that Nocard has well said: "It has almost the value of an experiment," and it is quite sure that we would unquestioningly accept evidence of much less value if any other disease than tuberculosis were concerned.

The cases reported by Stang,[41] Demme,[41] Gosse,[41] Ollivier,[42] and Law,[44] involving nineteen persons, are too well known to need repetition here.

Ebers[45] reports six cases, collected by several observers, of tuberculosis in children, attributed to the milk of tuberculous cows.

Bang[46] through inquiries in Denmark has collected reports of nine persons in whom infection could be traced with reasonable certainty to milk from tuberculous cows.

Von Ruck[47] reports the cases of a father and child which are very convincing, and says that he has observed several others in which there was very good reason to believe that milk was the agent of transmission for the tubercle bacillus.

Klebs and Rievel[48] have recently reported two cases which came under the observation of the former. A healthy young man employed by Klebs to assist in making some investigations on milk infection had the habit of drinking the milk of the tubercular cows used in the experiment. In a few months he died of miliary tuberculosis. The second case was one of six male children, who died at the age of two years of tuberculosis of the cord and meninges. This child was the only one of the six fed on cow's milk, and the only one that developed tuberculosis.

Post-mortem Evidence.— The reports of pathologists based on autopsies prove conclusively that in a certain proportion of persons dying of tuberculosis, and especially in children, the infection takes place through the intestine. As to the frequency of infection by this route there is a wide divergence of opinion, due partly, no doubt, to the fact that this method of infection is much more common in some localities than others, owing to local conditions, and partly to the interpretation given to the post-mortem findings. Our method of determining the portal of entry is not entirely satisfactory, as is shown by the large number of cases reported by many pathologists in which it is impossible to locate the primary lesion.

In general the determination of the primary lesion is based on the belief that the lymphatic glands in children give evidence of the duration and extent of tubercular disease in the organs with which they are in relation. Consequently if the bronchial glands show more advanced caseation than the mesenteric, the infection is put down as being through the respiratory tract. The fallacy of this has, I think, been demonstrated as regards infection through the tonsils, and that it is correct, even when the absorption takes place through the intestinal mucosa, is open to question. During intestinal digestion there is a constant current from the intestine to the mesenteric glands, and thence up the thoracic duct into the venous circulation. Any tubercle bacilli which may have gained entrance into this stream are carried almost immediately into the lung, and deposited there by election.

It has been shown by Dobroklonski,[49] working under Cornil, that the tubercle bacillus can penetrate the wall of the intestine in the absence of any demonstrable lesion, and that the contact does not need to be prolonged. As the result of carefully conducted experiments on animals, he says: "Tuberculosis can certainly invade the body through the digestive tract. For this invasion to occur, it is not necessary that there should be either a lesion of the intestinal wall, a desquamation of the epithelium, or any local modification whatever, or an anterior inflammatory process. The tuberculous virus (bacilli as well as spores) can easily pass through the epithelial lining of the intestine when it is entirely normal. This penetration is particularly easy at those points where the contact of the virus with the intestinal wall is prolonged, but it is not necessary that there should be prolonged contact or that it should be any longer than what occurs normally."

In our work at the laboratory of the State Live-stock Sanitary Board we have often been struck by the extensive involvement of

the lungs in animals infected by feeding, and the slight injury of the intestines. Indeed, in some animals it has been impossible to detect any involvement of the intestine at all.

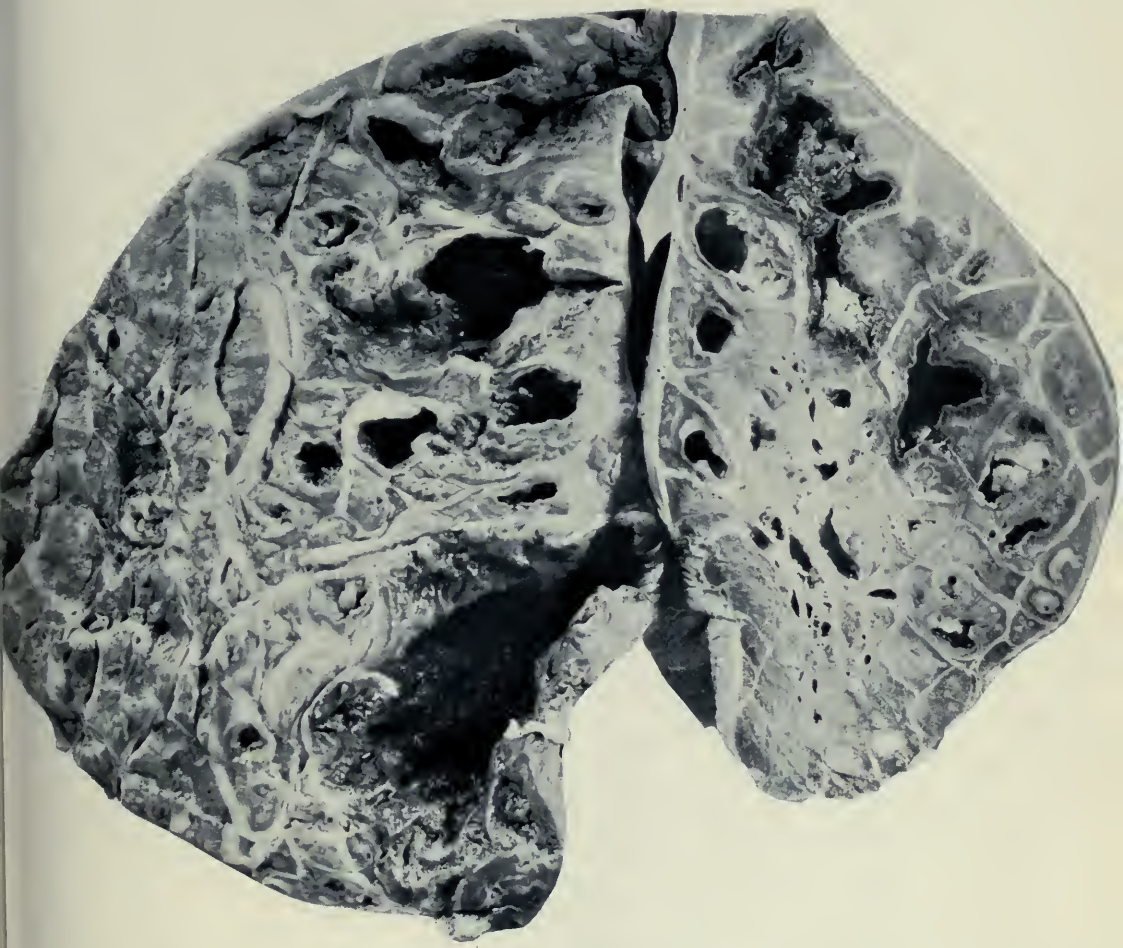
I ask your attention to specimens from two animals illustrating these points. The first is from a cow (No. 26435) which was fed with bovine tubercular material. Both lungs were involved and had cavities in them. The bronchial glands were enlarged, and showed small nodules. The mediastinal glands were enlarged and softened, but showed no nodules. The mesenteric glands were normal, and no lesion of the intestinal wall could be found.

The second is from a monkey fed with a pure culture obtained from the mesenteric gland of a child (culture BB.). (Fig. 6.) Both lungs were involved throughout, and to a much greater extent than the abdominal organs. The bronchial glands were enlarged and caseous. In the intestine only one point of injury could be found, and most of the mesenteric glands were normal in size, and showed a few nodules one millimeter in diameter. Three glands associated with the upper intestine were much enlarged and showed caseation, though not more advanced than what was seen in the bronchial glands.

The specimens from the monkey illustrate another important point, namely, the occurrence of coincident infection through the upper part of the digestive tract and the intestine. If this animal had been examined without the knowledge of its history it would almost certainly have been put down as one of those cases in which the avenue of infection could not be positively determined. The lungs showed much more extensive disease than any of the abdominal organs, and the bronchial glands showed caseation, as well as some of the mesenteric, and to an equal degree. This monkey was tested with tuberculin before the experiment began, and was in perfect health when the feeding with tubercle bacilli commenced. The key to the situation lies in the enlargement and caseation of the cervical lymphatic glands, indicating an infection through the tonsils or some neighboring part of the upper digestive tract, though no lesion could be detected. We have here an undoubted food tuberculosis, yet the respiratory tract shows the chief involvement. Does not the same thing occur also in children, and more often than we suspect?

With these facts in view it seems not impossible that an infection gaining entrance through the intestine may appear first in the lung, and thus be erroneously attributed to the respiratory tract.

On one point all pathologists as well as clinicians seem to agree,



G. 9.—Cow 26435. Inoculated by feeding bovine tuberculous material. Portion of lung showing extensive cavity formation. The intestines and mesenteric glands were free from disease.

that in children tuberculosis shows a marked tendency to become generalized, and this occurs with such rapidity that it is often impossible to decide where the infection gained entrance.

The post-mortem statistics are gathered mainly from hospitals and asylums for children, and it is in children that we have most reason to fear infection by food, their diet consisting as it does so largely of cow's milk. The tremendous mortality of children from tuberculosis has forced us to pay particular attention to the study of the factors at work in early life, and a number of interesting and valuable analyses of autopsy records have been published. From England we get the most positive evidence of infection through the intestine, and the most striking proofs of its frequency. English pathologists are practically unanimous in regarding the intestine as a frequent path of infection, the primary lesion being associated with this tract in about 25 per cent of all cases. We may examine the figures given by some of the more recent writers on this point.

Carr[50] examined 120 cases at the Victoria Hospital for Children, London. Of these in eighty-two the disease was generalized, in the sense that the lesions in different localities seemed to have a "common simultaneous origin from some infective center, or else that there were several quite independent tuberculous centers in different parts of the body." In seventy-nine cases the primary lesion was in the lung or bronchial glands; in twenty cases in the intestine or mesenteric glands; in six cases it was impossible to tell whether the respiratory or the digestive tract was first involved; in eleven cases widely separated caseous foci were found, and the primary lesion could not be located; in four cases no centers could be found, the lesions being generalized.

Guthrie,[51] at the Children's Hospital, Paddington, London, examined seventy-seven cases. He considered that in forty-two cases, or 54.5 per cent, the primary lesion was in the respiratory tract; in nineteen cases, or 24.6 per cent, it was in the intestinal tract. Of the remaining sixteen cases, the thoracic and abdominal organs were equally affected in seven; in six the origin was unknown, and in three otherwise accounted for. In only thirty-two cases could the origin of the tuberculosis be traced with certainty to the glands, to the thoracic seventeen times, and the mesenteric fifteen times.

Still,[52] at the Great Ormond Street Hospital for Children, in 769 consecutive autopsies on children under twelve years of age, found 269 cases which showed tuberculous lesions. Of these 117, or 43.5 per cent, were children under two years of age; and 56.5 per

cent—more than half the total number—were children under three years of age. The origin of the disease was as follows:

Lung	105	138=51.3 per cent.
Probably lung	33	
Intestine	53	63=23.4 per cent.
Probably intestine	10	
Ear	9	15= 5.5 per cent.
Probably ear	6	
Bones and joints	5	53=19.8 per cent.
Fauces	2	
Uncertain	46	

In forty-three cases in which death was due to other causes, such as diphtheria, heart disease, etc., the primary focus of infection could be determined with great certainty, as the tuberculosis had not become generalized. Among these the primary lesion was respiratory in twenty-six cases, or 60.4 per cent; intestinal in sixteen, or 37.8 per cent; and in the ear three times.

Dr. Shennan,[53] of the Royal Hospital for Sick Children, in Edinburgh, found among 278 cases of tuberculosis 28.1 per cent in which infection had taken place by the intestinal tract, showing that the high percentage in which this route of infection is observed is not confined to London, where it might be supposed that conditions were such as to favor it specially.

The few reports we have from America indicate that infection through the intestine is much less frequent than in England.

Northrup[54] reports that among 125 autopsies in only three was the primary lesion found in the intestinal tract. In thirty-four cases, however, the disease was so general and far advanced that he was unable to determine the mode of invasion.

Holt[55] among 119 tubercular children examined post mortem found the intestines affected forty times and mesenteric glands thirty-eight times, but in no case did he consider the intestine as the route of invasion.

Bovaird,[56] in 1899, published the records of seventy-five autopsies on tubercular children. In sixty cases infection had taken place through the respiratory tract; in eight the bronchial and mesenteric glands were equally involved, and in seven the records were incomplete. He has recently[57] added the record of fifty cases, among which two cases of primary intestinal infection occurred. The number of indeterminate cases is not given.

German statistics, as far as I have been able to obtain them, do not sustain Koch's position, although they indicate that primary intestinal tuberculosis is not so common in that country as in England, which we would hardly expect, considering the precautions prescribed in Germany and the lack of regulations in England.

However, intestinal involvement in children appears to be quite frequent in most parts of Germany; and as many of the reports do not clearly indicate the primary seat of invasion, we are justified in believing that a fair proportion of these cases are due to intestinal infection. For example, the statement given by Koch and attributed to Baginsky—that among 933 cases of tuberculosis in children he never found tuberculosis of the intestine without simultaneous disease of the lungs and bronchial glands—is entirely indefinite as to the primary seat of the disease, and as quoted furnishes no ground whatever for Koch to stand on.

Against the figures given by Koch—which are confined to his own experience—the reports of Baginsky, and a series of cases attributed to Biedert, we have the statement of Professor Hueppe[22] that "the number of these cases (primary intestinal tuberculosis) occurring in children is by no means so small as Koch alleged. The number of cases may be fairly reckoned as between 25 and 35 per cent of all deaths of children from tuberculosis."

Among fourteen children who died from other diseases, and in whom the existence of tuberculosis was not recognized before death, Kossel[58] found tuberculosis of the bronchial glands ten times and of the mesenteric glands four times. In twenty-two children who died of tuberculosis he found the disease confined to the intestinal tract in only one case.

It is unnecessary to quote further statistics on this point. The extent of intestinal tuberculosis varies in different countries and in different parts of the same country—a fact which of itself indicates a local factor, such as the greater or less prevalence of tuberculosis in cattle. One cannot study such statistics as those given without being fully convinced that a very important proportion of the children who die of tuberculosis are infected through their food, and that the report made to the council of the British Medical Association was justified, namely, that "the mortality from tuberculosis in early childhood is not decreasing as it is at other ages in the United Kingdom, and the opinion that this great prevalence of the disease in childhood is due to infection through the alimentary canal by milk from tuberculous cows appears to be well founded."[59]

Extent of Tuberculosis in Cattle.—It is well known and so universally acknowledged that tuberculosis is a wide-spread scourge in cattle that it would be superfluous to give an array of figures showing the extent of its ravages in various countries. Those interested in this phase of the subject will find the latest statistics given by Dr. Leonard Pearson in Bulletin No. 75, issued by the Common-

wealth of Pennsylvania, Department of Agriculture. In studying such statistics it must be borne in mind that it is the milch cow, and especially the cow on the dairy farms near large cities, that is most apt to fall a victim to tuberculosis. In Pennsylvania, Dr. Pearson[60] has found that of the tubercular herds tested about 13 per cent of the animals had tuberculosis. Some herds show a very high proportion of diseased animals. Thus, for example:

Among	174	cattle	166	were tubercular.
"	73	"	59	" "
"	22	"	17	" "
"	14	"	14	" "
"	20	"	20	" "
"	59	"	53	" "

In other parts of the State tuberculosis is very rare or even unknown. These places are found in the interior counties, where the stock is "native" for the most part, or were stocked at a time when bovine tuberculosis was very little known in the United States.

There has been and is considerable discussion as to the stage of the disease at which a tubercular cow becomes dangerous through the passage of tubercle bacilli into her milk. Some authorities hold that there must be actual disease of the udder for this to occur, while others believe that this is not necessary. As early as 1893 Dr. Theobald Smith showed that the tubercle bacillus may be found in the milk of tubercular cows when the udder, so far as the naked eye could tell, was free from disease. In a series of experiments at the laboratory of the State Live-stock Sanitary Board of Pennsylvania the mixed milk of five cows was examined by intraperitoneal inoculation of guinea-pigs. These cows had reacted to tuberculin, but were in good condition and of fine appearance. Repeated examinations of the udders by several veterinarians failed to reveal any lesion, and examination after death of the animals gave the same negative results. No attempt was made to concentrate the bacilli; on the contrary, the whole quantity of milk was well shaken, in order to imitate as nearly as possible natural conditions, and moderate doses of milk (10 cubic centimeters) were used. Of eighty-eight guinea-pigs employed in this test sixty-three lived long enough for the development of tuberculosis, and of these ten, or 15.8 per cent, became tubercular.

More surprising and more unusual are the results of Rabinowitsch and Kempner,[61] who inoculated the milk of fifteen cows into guinea-pigs, the experiment being made to determine whether

or not the milk of cows having a tuberculosis which could be detected only by tuberculin, and not by physical examination, might be virulent. Three examinations were made by a veterinarian in the course of the experiment. Of the fifteen animals ten were found to give virulent milk, a percentage of 66.6. One cow gave milk which contained a yellowish, gelatinous material, and caused a fatal peritonitis of all animals inoculated. Leaving this out, the positive results amount to 71.4 per cent. All of the cows had reacted to tuberculin, but none showed clinical evidence of udder disease when the experiment began. Of the ten giving virulent milk three showed advanced general tuberculosis, but no disease of the udder; two showed no evidence of disease at all, and one only on the second and third examinations. One cow had râles at time of first examination, but these disappeared, and she showed no evidence of disease after. On post-mortem one cow was found to have tuberculosis of the udder, and one showed clinical evidence of it on the third examination, made six months after the experiment was begun. The authors conclude: "Milk may contain tubercle bacilli, first, in beginning tuberculosis, without discoverable disease of the udder, and, second, in latent tuberculosis that can be detected only by the tuberculin reaction;" also, "milk from cows that react to tuberculin must be suspected of being infectious in every case."

With these results before us we must admit that while tuberculosis of the udder is the most dangerous condition, we cannot by any means regard the milk of cows with general tuberculosis, but the udders of which are free from the disease, as being safe for food. We must insist that danger is not limited to those herds which harbor one or more cows with udder tuberculosis. I cannot agree with those writers who attempt to belittle the dangers to which milk-fed babies are exposed by pointing out the comparative infrequency of tuberculosis of the udder. Dilution with the milk of other cows free from tuberculosis no doubt lessens the danger, but does not remove it.

Acid-fast Bacilli.—A few years ago Möller announced the discovery of a bacillus having the morphology and staining reactions of the tubercle bacillus. He has shown that this bacillus and others closely allied to it may constantly be found in forage and in the feces of animals fed on such forage. Petri, Rabinowitsch, Grassberger, Korn, and others have found the same or like bacilli in milk, butter, and margarine; Rabinowitsch has isolated one of the same group from a case of gangrene of the lung in man; Karlinsky has shown their presence in nasal mucus; and Marpman has found

them in urine; so that we know that this group of "acid-fast" bacilli has a wide distribution in nature. The property of resisting decolorization by mineral acids was for a long time considered diagnostic of the tubercle bacillus. The discovery, therefore, of a comparatively large group of organisms having the same property, and being indistinguishable morphologically under the microscope, has served to throw some doubt on researches in which the microscope has been relied on entirely to demonstrate the presence of the tubercle bacillus in milk. Animals such as guinea-pigs and rabbits inoculated intraperitoneally with cultures of these bacilli, or with milk, butter, etc., containing them, develop nodules which may sometimes be mistaken for tuberculosis. However, such mistakes must be rare, and there can be no doubt that the true tubercle bacillus passes into the milk of tubercular cows, as shown above. Reinoculation, microscopical examination of the tissues, and the isolation of cultures can be relied upon to clear up the diagnosis of any doubtful cases.

Solution of the Problem.—In the solution of the problem before us the most directly valuable data will, I think, be obtained from the examination of cultures isolated from the abdominal organs of children in whom there is reasonable evidence of infection by the intestinal tract. When these cultures are found to have a high degree of pathogenic power, and are able to infect cattle in moderate doses, we will be justified in saying that the children from whom they were obtained were infected in the first instance from bovine sources. By the examination of a large number of such cases we will, I believe, obtain very valuable information as to the frequency with which children are infected by milk. On the other hand, I do not consider that we can entirely exclude bovine infection even in those cases where the abdominal organs yield a culture of feeble virulence, for the reason that we at present know nothing of the effect produced on the bovine bacillus by prolonged residence in the human body. It is certain that the various types of tubercle bacillus known to us have sprung from a stock common to them all, and that they have acquired their racial peculiarities by residence in different animals, through which they are subjected to a difference in food, temperature, and resistance. In other words, the struggle for life is carried on in the various species of animals under varying conditions, the result being that in each animal the tubercle bacillus acquires properties which best enable it to carry on life in that particular host. The acquisition of these peculiarities no doubt requires a certain lapse of time, but how much we do not know. We have

experimental evidence that it does not require a great time to change the tubercle bacillus from a higher into a lower type. By the method of inoculation in the peritoneal cavity in collodion sacs Nocard[62] has shown that in from five to eight months both the bovine and human bacillus can be made to acquire the cultural characteristics of the avian bacillus, and to a certain extent its pathogenic action also. A few passages from fowl to fowl during four to six months increased this greatly. By passage through the blindworm Möller[63] has in the course of a year so changed the human tubercle bacillus that it grows like the organism of fish tuberculosis, and has the same temperature reactions. It grows best at 20° C., and ceases to grow entirely at 30° C. The bacillus of fish tuberculosis, discovered by Dubard,[29] had for its origin the human bacillus, the fish having fed on the sputum and dejecta from a patient far advanced in phthisis. The fish had been subjected to this for about a year before the disease was noticed.

With these facts before us I do not think we are forcing a point in believing that it is at least possible for the bovine bacillus to become rapidly so changed in the body of man that it will show the cultural and pathogenic peculiarities which we find usually in cultures of human origin. For these reasons our observations should be made by preference on cases which are rapid and acute.

Conclusion.—The evidence at hand forces us to conclude that human and bovine tuberculosis are but slightly different manifestations of one and the same disease, and that they are intercommunicable. Bovine tuberculosis is, therefore, a menace to human health. We are not in a position at present to define positively the extent of this danger, but that it really exists cannot be denied. In the past there has probably been a tendency to exaggeration; however great this may have been it does not now justify any attempt at belittling the risk, and it is folly to blind ourselves to it.

The eradication of bovine tuberculosis is amply justifiable from a purely economical standpoint; viewed in its bearing on human health it becomes a public duty.

NOTE.—The illustrations in the above paper are all from photographs, for which I am indebted to Mr. W. H. Walmsley, of Philadelphia. The coloring of Figs. 1 and 6 was done by Mrs. J. D. Z. Chase, of Philadelphia, to whom also I am under obligation.—M. P. R.

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EXOPHTHALMIC GOITRE.[1]

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An account of the theories proposed to explain the nature of exophthalmic goitre is in itself a sort of psychological study. The literature upon the subject has grown to enormous proportions. The most complete discussion is to be found in Kocher's monograph, "Ueber Morbus Basedowi," published this year in Jena, and containing an exhaustive bibliography with 1423 references. The number of the hypotheses that have been suggested, the warmth with which they have been defended, and the fragile bases upon which they have been erected, exhibit anything but the true scientific spirit.

Without attempting a *résumé* of all these views and arguments, I purpose to examine critically only the two principal ones now in vogue, and to indicate, if possible, which in my opinion has the stronger arguments in its favor. Of course it is to be understood that no explanation of the disease, even at this time, is entirely satisfactory. We are still as ignorant of the real nature of exophthalmic goitre as ever.

The older of the two views which I wish to bring before you holds that in exophthalmic goitre the central nervous system is at fault. The trouble is primarily and entirely a central neurosis, this term being the best that we can employ, poor as it is. I will not stop to consider the many attempts to localize this neurotic process in the medulla oblongata (Filehne, Durdufi, Bienfait, Sattler, Fitzgerald), the cerebral cortex (Newman), or the peripheral nervous apparatus, including especially the vasomotor sympathetic system (Abadie). Enough for the present that this hypothesis assumes that there is a functional disturbance, toxic or quasi-physiological, within the cellular elements of the central nervous apparatus, and that all of the symptoms of the disease, such as the tachycardia, the goitre, the exophthalmus, the trembling, the hyperidrosis, are the result of the neurosis and are in no way dependent one upon another.

The other theory of the disease, and the one extremely popular at the present time, is the so-called "hyperthyroidation" or "dysthyroidation" theory. This explanation was first made by Mobius, of Berlin, in 1886, and has been ably supported by Wette and

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Muller in Germany; Joffroy, Brissaud, Regnault, and Boinet in France; Bramwell, Murray, Adam, and Greenfield in England; and Starr and others in America. In accordance with this view the primary disease is in the thyroid gland, which thereby produces an excessive or altered secretion, which secretion acts somehow upon the nervous system to bring about all the phenomena of exophthalmic goitre except the goitre. This theory is right in line with the general trend of modern science to assign a toxic cause for most of the ills that flesh is heir to. The toxic idea is always a convenient one to fall back upon in these days of bacteriology, ptomaines, leucomaines, etc. Some hold that this excessive and altered secretion of the thyroid gland is the toxic substance; others maintain that the poisonous substance is the result of the normal metabolism of the body, which substance or metabolic process is not antagonized, as it should be and is by the normal thyroid secretion.

Both of these views, the nervous and the glandular, have strong support among the authorities. Both rest upon a certain amount of experimentation and clinical observation. Both are incomplete, and yet both have been advocated as though they were positively established. Since argument, logical deduction, and inference have played so important a rôle in the advocacy of both theories, it is perfectly legitimate in criticizing them to employ the same method to analyze the strength of the premises, the correctness of the logic, and the justness of the conclusions drawn from the data at hand.

There are four theories based upon the supposed etiological importance of the thyroid gland and its secretion:

1. There is an *altered* thyroid secretion which acts *directly* upon the nervous system deleteriously (direct thyroid intoxication).

2. There is an *excessive unaltered* thyroid secretion which, possibly through its iodine or thyroiodin, acts *directly* upon the nervous system (direct thyroid overstimulation or paralysis of inhibition).

3. There is an *excessive and altered* thyroid secretion which fails to perform its normal function of neutralizing the deleterious products of the normal body metabolism, which products are thereby allowed to injure the nervous system (indirect thyroid intoxication).

4. There is an *altered* thyroid secretion which may or may not be excessive, but which fails to check the *accumulation* of the products of the normal body metabolism, which products hurt the nervous system by reason of their mere accumulation (indirect thyroid intoxication).

The nervous phenomena, which even the thyroidationists admit constitute the whole of the symptomatology of exophthalmic goitre

except the struma, are all secondary, both as to sequence and etiological importance, to any one of these four manifestations of the diseased gland and its secretion. In a word, Graves's disease is essentially and primarily a disease of the thyroid gland. The nervous phenomena bear the same relation to the disease as the nervous manifestations of typhoid fever or of Bright's disease bear to these pathological processes. To maintain this thesis the thyroid change should be demonstrable beyond all peradventure in every case; and it should possess at least all of the testimony in its favor which the neurotic manifestations now possess in theirs. The nervous phenomena are self-evident and are more or less obvious in every case. Is disease of the thyroid gland equally self-evident and uniformly demonstrable? The presence of the nervous phenomena is recognizable by everybody, but are the believers in the glandular theory ready to assert upon the data already at hand that the affection of the thyroid can be demonstrated in every case of exophthalmic goitre? Suppose it is shown that the thyroid is diseased in every case, the real question still at issue would be whether the disturbance of the nervous system, which is so obvious, precedes or follows the functionally altered thyroid. So overwhelmingly prominent are the nervous symptoms that some of the strongest advocates of the gland theory are beginning to beg the question by affirming that the alteration in the function of the thyroid gland has its origin somewhere and somehow in the nervous apparatus, while the more prominent symptoms of the disease are to be attributed to the thyroid. Marie thus straddles the fence and calls attention to the fact that exophthalmus never occurs in myxedema when the thyroid extract is administered. Dana argues that the nervous system first affects the thyroid, and that this again, through its altered secretion, reacts upon the nervous system. Vetlesen, Londe, and many others believe that the hypersecretion which gives rise to most of the symptoms of the disease is itself brought about by an original disturbance in the nervous system. The whole question is thus thrown into a state of almost inextricable confusion. Let us see if we can give any distinctness to the points at issue, and then we will be in a better position to assign the proper valuations to the various arguments and data in favor of the thyroid or neurotic theory.

If the altered thyroid is the cause of exophthalmic goitre, obviously it should precede in time all of the other symptoms of the disease. This it does not always do. The goitre is often absent or late in developing. Cases of Graves's disease without struma have been observed by v. Graefe, Dusch, Pauli, Trousseau, Mackenzie,

Degranges, Fisher, Raymond, Hitschman, Charcot, and others. Gordon records that Savage found in the District of Columbia only one case of Graves's disease among one thousand goitres. Occasionally the thyroid recedes in size, while the other manifestations of the disease continue or even increase. Flint had under his observation for three years a case in which there was no material change except that the thyroid enlargement disappeared. The pulse remained habitually at 140. There seems to be no apparent relationship between the size of the goitre and the severity of the other symptoms of the disease. One thing is quite noticeable, however, and that is that the struma is very rarely if ever the earliest symptom. Irregularity of the heart's action is usually the first sign. The order in which the symptoms appear is far from being settled among authors. Nothnagel enumerates them as exophthalmus, struma, and tachycardia, while Jaccoud says it is palpitation, dilatation of the arteries, enlargement of the thyroid, and exophthalmus.

Many questions await an answer in regard to the nature of the change in the thyroid by reason of which it gives rise to the particular set of symptoms recognized under the name of exophthalmic goitre. We must know more of the nature of the thyroid secretion; whether, indeed, it is a toxin. As a matter of fact we know absolutely nothing about such a substance, the mere discovery of and experimentation with the iodine constituents not being satisfactory. We know scarcely anything about the normal function of the thyroid gland, and how can we therefore predicate anything of certainty with regard to the abnormal gland?

The special way in which this thyroid secretion acts to bring about Graves's disease must needs be explained. It must be shown how the gland secretion exerts its influence directly upon the nervous elements or indirectly upon the body metabolism to provoke a definite, regularly recognizable set of symptoms, which so far as we now know are not produced by any other toxin or glandular secretion.

In the normal thyroid a substance has been found principally combined with a proteid, although also free. This is known as *thyroiodin* or *iodothyrin*. It contains 9.3 per cent of iodine and 0.56 per cent of phosphorus. Jannin noted the similarity in the manifestations of severe iodism and exophthalmic goitre, and said he believed that chronic iodism or thyroidism was the cause of the latter disease. Gautier confirmed Jannin's observations. Boinet cited cases of Graves's disease produced directly by the consumption of large quantities of thyroid substance, and stated that he

believed the iodine in the thyroid substance was the cause of the symptoms. Many others have expressed the same opinion.

In spite of the fact that iodine and the iodides have been deemed positively harmful in the treatment of this disease, cases are constantly being reported in which both their internal and external administration have proved beneficial. I have seen good results follow the exhibition of the iodides and hydriodic acid. Gowers refers to the remedies without commending or condemning them. Oppenheim says that potassium iodide may be tried, but must be used cautiously. Dana mentions the iodides as among the few remedies that have given him good results, and notes that many writers now lay great stress on the direct treatment of the thyroid gland by rubbing it daily with the red iodide of mercury or by painting it with iodine. One would fancy that if the disease symptoms are due to a hypersecretion of the thyroid gland, and especially to the iodine in it, that the iodine treatment should be as heartily condemned as is the treatment by means of the administration of thyroid substance. To clinch the argument, as it were, that it is not the iodine, whatever else it may be, that causes the clinical picture of Graves's disease, A. M. Starker comes forward with a case in which myxedema resulted from the long use of iodide of potassium for another affection. In passing let it be noted that Durdufi claims to have produced symptoms closely resembling those of Graves's disease with cocaine.

In addition to the composition of its secretion, we must know many other things before we can dogmatize about the normal or abnormal action of the thyroid gland. For instance, we must explain away or account for in terms of its function many questions in regard to heredity, age, sex, temperament, all of which seem to play so prominent a rôle in the etiology of exophthalmic goitre.

As we all know, heredity is found in a very large proportion of the cases of Graves's disease. Rarely it is direct, as in the three cases cited by me; more often there are antecedent nervous troubles such as hysteria, epilepsy, insanity. Heretofore it has not been shown that glandular diseases are so strikingly subject to the law of heredity as Graves's disease seems to be. It is true that certain tendencies run in certain families, as for instance weakness of the lungs, of the heart, or of the stomach, but no such heredity has ever been postulated of these or any other organs outside of the nervous system as has here been attributed to the thyroid gland. It cannot be said that it is merely the unusual susceptibility of the nervous system that is inherited in this disease, for the heredity is too pronounced and occasionally too direct (eight members of one

family in one instance) to be ascribed merely to so indefinite a condition as susceptibility. On the other hand, if it is answered that it is the peculiar nervous influence preceding the disturbance of the gland function which is the result of the heredity, it may be said that that is begging the question, for with such an explanation the thyroid secretion cannot be justly considered the cause of the disease any more than can glycosuria be regarded as the cause of diabetes mellitus.

Again, it has been thought that there is some connection between the sexual apparatus and the thyroid gland. It is said to undergo changes at puberty, though the physiologists do not specifically mention any such connection. It is an accepted fact that the thyroid function plays an important rôle in the general metabolism of the body, and the metabolic functions are powerfully influenced by the great climacteric periods. Thus the inferred connection between the thyroid and the sexual glands may be merely one of simultaneous and coincident activity without there being any closer intimacy. At all events it is argued that the etiological importance of the thyroid gland in exophthalmic goitre is shown in this supposed relationship between the thyroid and sexual functions because it has been observed that sex, pregnancy, and the puerperal state are significant as predisposing factors in the causation of Graves's disease. Of course, this leaves entirely out of view the much older and better established observation that those same factors, sex, pregnancy, etc., affect most profoundly the nervous system of the woman, and for that reason are quite competent to predispose to the production of exophthalmic goitre without the necessity of the intervention of a modified though perchance related thyroid function.

Admitting that the thyroid gland does show changes suggestive of its relationship with the sexual organs, it is to be remembered that Graves's disease occurs in women ten times more frequently than in men, and that it must be shown that there is a correspondingly large functional if not structural difference between the thyroid glands of men and women normally. This difference has not yet been demonstrated. Exophthalmic goitre is sometimes called a "woman's disease." Hysteria and certain other neuroses are also female diseases, merely by reason of the influence of their peculiar sexual lives upon their nervous systems. The nervous apparatus of the woman does not differ *per se* so far as we know from the nervous system of the man, and is only unlike his in being subjected to certain powerful influences of a physiological nature in connection with the sexual organs. This brings about an *apparent* difference between

the nervous systems of men and women. The thyroid gland is subject to nervous influences of a powerful sort, and this is probably the reason it manifests an apparent difference, in function at least, in men and women. The frequency of exophthalmic goitre in the female sex seems to me to argue in favor of the neurotic rather than the glandular origin of the disease.

The thyroid gland seems to be enjoying a high degree of popularity these days as a cause of disease. The brilliant results obtained from its administration in myxedema and cretinism have stimulated the profession to look upon it as the source of many affections whose symptoms are the opposite of these diseases. Already Graves's disease is attributed to it, and we are asked to believe that paralysis agitans as well as myoclonus familiaris is also dependent upon it (Lundborg). Because certain changes are found in the gland in these various diseases, it is assumed that these changes antedate and are the cause of the nervous troubles instead of *vice versa*. The assumption is a bold one, but needs a great deal more proof than is yet in hand before it can be accepted as final and conclusive.

The age at which exophthalmic goitre usually begins and is most frequent seems to me to argue against the thyroid and in favor of the neurotic origin of the disease. It is seen in all periods of life, childhood as well as old age, but most commonly in the second decade of women and the third of men. Those who see a relationship between the thyroid and sexual functions explain this upon the ground that the second and third decades of life are the periods of the greatest sexual activity. Is it not a bit illogical to attribute, as is too often done, pathological tendencies with histological changes in certain glands upon the ground of mere physiological activity? There is no contention, observe, that the thyroid gland is overactive at this time, but merely that during this period of highest physiological activity in the sexual organs the supposedly related thyroid is brought into higher but still physiological activity. The ovaries and mammary glands are aroused into greater activity also during this period, but they are not said to become diseased from this cause alone. There is a closer relationship and similarity both in the time and degree of sexual activity between men and women than there is in the relative frequency of exophthalmic goitre between them.

A word in regard to the onset of Graves's disease. Most cases appear gradually, but not a few come on with great suddenness, usually after a severe mental shock or other profound nervous disturbance. Bartholow has recorded a case in which the first symp-

tom, protrusion of the eyes, was noticed by the patient on going to a mirror on the morning after having experienced a great shock the night before. A sudden physical strain and prolonged, exhausting labor have not unfrequently eventuated in a rapid onset of exophthalmic goitre. It is difficult to understand just how these cases are to be attributed to an altered secretion of a gland whose substance must presumably undergo a time-consuming change.

The association of exophthalmic goitre with hysteria, epilepsy, mental deterioration, and other neuroses has been noted by the hypersecretionists, who explain that these neuroses render the nervous system specially predisposed to yield to the deleterious influence of the altered thyroid secretion. Their explanation, however, explains too much, for in that case we should meet with Graves's disease more frequently than we do among hysteriacs, epileptics, and the insane, since they not only suffer from goitre without the production of the exophthalmic variety of symptoms, but the larger percentage of the disease occurs in people who are neither hysterical, epileptic, nor of unsound mind. Whatever the predisposing neurosis may be it is not any of these, though it may be closely related to them.

The symptomatology of exophthalmic goitre speaks loudly in favor of its being a nervous rather than a glandular disease. Not only are the symptoms preëminently neurotic quantitatively, but qualitatively as well. They constitute the clinical picture and are so manifest that even the supporters of the glandular theory recognize the fact that clinically Graves's disease is a nervous disease, though they attribute these neurotic manifestations which are so obvious to a glandular secretion which is so obscure. The victims of the disease are very irritable, apprehensive, lachrymose, subject to insomnia, impairment of memory, diminished power of application, headache, vertigo, tremors, and various hysterical manifestations. Bulimia followed by anorexia is not uncommon. In addition to these, the frequent absence of the goitre, the early appearance of the tachycardia, and the relative prominence of the exophthalmus, together with all the secondary symptoms, such as the trembling, the hyperidrosis, v. Graefe's sign, pigmentation, decrease of electrical resistance, etc., point clearly to the nervous system as the affected part of the organism. These symptoms form so remarkably uniform and well recognized a picture that one rarely has difficulty in making a diagnosis. It has been suggested that under the name exophthalmic goitre there are included several diseases, just as there are several kinds of diabetes. However that may be, there cannot be any doubt about the distinctness and individuality of the

symptom-group known as Graves's disease. Whether we believe that the seat of the neurosis is in the sympathetic system, the vasomotor centers of the medulla, the restiform bodies, or the cerebral cortex, the fact remains that it is always more or less the same parts that are affected. Therefore we must suppose either that the thyroid secretion possesses some mysterious selective power, or that these particular parts of the nervous system are especially susceptible to that secretion. As the toxin is here still present and active, its influence upon the nervous system is comparable to the influence of the syphilitic virus as seen in cerebrospinal syphilis rather than in locomotor ataxia. Cerebrospinal syphilis is notorious for the irregularity and uncertainty of its manifestations, whereas locomotor ataxia, being a mere sequel of the syphilitic storm, is a regular, definite disease with a regular, uniform clinical picture. Clinically, exophthalmic goitre has the same systematic regularity that locomotor ataxia has, and yet the hypersecretionists would have us believe that it is the result of a cause which according to all rules of analogy should give rise to a set of symptoms as bizarre, irregular, and uncertain as are those of cerebrospinal syphilis!

What explanation with the thyroidation theory are we to offer of the fact that the gland enlarges twice as often on the right side as on the left, and that the exophthalmus, when unilateral, as it is in rare instances, occurs on the same side as the enlargement of the gland? Even the hyperidrosis is at times unilateral.

Another difficulty which presents itself in connection with the symptomatology of exophthalmic goitre, and which is quite unexplainable upon the thyroidation theory, is that the vascular enlargement of the gland follows the tachycardia and vasomotor disturbance. Hypersecretion is physiologically always dependent upon increased vascularization. In this case, however, it is assumed that the vasomotor excitement which provokes the increased vascularization of the gland does not precede but follows the hypersecretion. There are two possible escapes from the dilemma. In the first place it may be assumed that in the beginning of the disease there is not an excessive thyroid secretion, but merely an altered one, and that this altered secretion excites the vasomotor apparatus to a sudden and increased vascularization of the gland. On the other hand it may be suggested that the structural condition of the gland and its secretion are not the same after as before the tachycardia and other vasomotor disturbances have appeared. Not only are both of these and kindred explanations without demonstrable proof, but even as explanations they are more tortuous and less clearly indicated than

is the view that the tachycardia is primarily a nervous trouble, which together with the vasomotor disturbance produces later on the enlargement of the thyroid gland and its resultant hypersecretion.

The pathological findings are not even strongly confirmative of the hyperthyroidation theory. The changes discovered in the thyroid gland are not always constant and uniform, and such changes as have been found have not always been associated with the symptom-group known as exophthalmic goitre. According to Marie there is no line of distinction to be drawn between the thyroids of exophthalmic goitre and ordinary bronchocele. Joffroy and Achard have voiced the same opinion. Vandervelde and Le Boeuf examined four cases histologically with great care and found the goitres of Graves's disease exactly the same as ordinary goitres. On the strength of these observations they rejected the hyperthyroidation theory. Brissaud refers to exophthalmic goitre as "a group of symptoms rather than an independent disease," and then notes that changes in the thyroid gland were observed in twenty-five cases of various chronic diseases. As these changes did not give rise to the exophthalmic group of symptoms, it looks very much as if the gland changes were due to the nervous trouble.

Very little is known in regard to the supposed altered secretion of the thyroid gland, and as to its mode of action we have nothing but theories and hypotheses. Gley found in Graves's disease that the thyroid secretion contained only one-tenth as much iodoproteid as normally, and the general view is that the change in the secretion which brings about the nervous manifestations of the disease involves principally the iodothyrin. It has been argued that the toxic theory of the disease is strengthened by the fact that the urine of persons suffering from it is highly poisonous. Donath, however, found no iodine in the urine of normal individuals or those fed with iodothyrin in doses of 1.8 milligrammes. This poisonous urine moreover does not produce any condition at all resembling exophthalmic goitre when injected into dogs.

In accordance with the hyperthyroidation theory, the employment of belladonna in the treatment of the disease ought to afford most gratifying results. Some authorities do claim good results from the use of belladonna, but by far the majority have found this drug quite ineffectual. The best treatment for the disease has been found to be absolute rest, physical and mental, electricity, certain surgical procedures, and nerve sedatives such as codeine, opium, hyoscyamus, and the bromides. It is hardly supposable that the effect of these nerve sedatives is merely to quiet and suppress the

nervous manifestations of the disease while the abnormal activity of the thyroid gland continues, for if that were so all of the nervous phenomena would immediately return the moment the treatment was discontinued. Only two theories are possible to explain the success of the sedative treatment in this disease, viz., that either the thyroid change is the result of a disturbance in the nervous system, or that the whole disease is primarily neurotic in origin and continuation. In both instances the thyroid gland is of secondary importance in regard to the etiology and pathogenesis of exophthalmic goitre.

The uncertainty as to the advisability of using iodine, the iodides, and hydriodic acid in the treatment of this disease springs largely from the supposition that the iodothyrin of the thyroid secretion plays a prominent rôle in its causation. In accordance with the hyperthyroidation theory they are strongly contraindicated, and yet as I have already pointed out and have witnessed in my own experience, in some few cases they have proved beneficial.

The same may be said in regard to the use of thyroid extract. Before it is to be irrevocably and dogmatically condemned, a better founded explanation of the disease than is contained in the hyperthyroidation theory should be forthcoming, and some adequate reason given for the occasional case that recovers after the administration of the thyroid substance. One of my cases is now free from every sign of the disease after taking the thyroid extract in five-grain doses three times a day on and off for two years. Another case still under observation failed to respond to other lines of treatment, but is improving with the use of two grains of the extract three times a day. In both of these cases the patients themselves feel that the thyroid treatment is the most effectual for them, and when I suggest a change of treatment they offer strong protests. It is no argument in favor of the hyperthyroidation theory that in a large majority of the cases the administration of thyroid substance provokes an increase of the symptoms. Thyroid substance often provokes nervous manifestations when given in other diseases and to healthy individuals. I have under observation a mild case of sporadic cretinism in a child six years of age in which very small doses of thyroid extract cause marked nervous phenomena. All that is proved by the increase of symptoms provoked by the administration of thyroid substance in exophthalmic goitre is that in this disease the nervous system is weak and preëminently susceptible.

In connection with this question of the administration of the thyroid gland, I would like to call attention to the fact that exophthalmic goitre and myxedema are not, except in some minor and

very superficial respects, opposite or antithetical diseases as is so triumphantly asserted by the upholders of the hypersecretion theory, and that all inferences drawn from the use of thyroid extract in the treatment of myxedema will fail to assist us in making assumptions in regard to its avoidance in Graves's disease. The thyroid gland may and does produce, as physiologists tell us, more than one secretion, and upon the strength of this the hypersecretionists may some day be able to demonstrate the reason for the somewhat apparent opposite character of some of the symptoms of these two diseases. That they cannot possibly be due to opposite states or modes of action of a single thyroid secretion is proved by the observation of the two sets of symptoms in the same patient at the same time. A remarkable example of this was recorded by Pasteur, who ended his report with the words: "It is interesting to note that the patient presented simultaneously some of the signs and symptoms of both Graves's disease and of myxedema. For in association with a persistent exophthalmus, a smooth skin, tendency to perspiration, and occasional marked tremor of the hand, we find an apathetic demeanor, extreme sensitiveness to cold, some clumsiness of the fingers, and alteration of the voice to a slight extent." Two cases of Sollier's, reported by Bourneville, presented the coexistence of a generalized edema with exophthalmic goitre. One showed all the characteristics of a genuine myxedema, and in both the thyroid, instead of being enlarged, was atrophied. All arguments for the hypersecretion theory of Graves's disease based upon its supposed antithesis to myxedema thus fall to the ground.

Surgery has even been subpœned to bear testimony in favor of the hyperthyroidation theory. Four operations are performed, namely, thyroidectomy, resection of the sympathetic, ligation of the thyroid arteries, and Jaboulay's exothyropexie (exposure of the gland to the air). Of these operations, thyroidectomy is the most popular, and though its mortality ranges about fifteen per cent, it is nevertheless resorted to, when other treatment has failed, because in about half the cases operated on a cure follows. It is stated that these operations diminish the secretion of the gland by cutting off its blood-supply or removing part of its substance. It is hard to comprehend how any one of the operations can restore an altered secretion, though they may cause a diminution in its quantity. Somehow I am reminded, when I think of the success of these operative procedures in exophthalmic goitre, of the cures that used to be heralded and were actually accomplished at times in hysteria by operations upon the ovaries and uterus. Surgical shock will do wonders at

times upon the neuroses. Curiously enough A. Pader and L. N. Robinson have expressed their belief that exophthalmic goitre is a form of hysteria and is due to the same causes, while Putnam intimates a somewhat similar belief when after a study of exophthalmic goitre in its relation to emotionalism he concludes by saying that it is "a degenerative neurosis and marks one of the many lines of cleavage at which the nervous functions break when exposed to strain."

Still further and finally, in support of the contention that exophthalmic goitre is a nervous rather than a glandular disease, Homberger found no specific insanity but all forms of insanity occurring with it.

In conclusion I must say in the words of Oppenheim that "the hypothesis which refers the disease to an abnormal increase in function of the thyroid gland is not very convincing." As both the hyperthyroidation and neurotic theories are still unestablished, after applying the same methods of reasoning to both and studying both from the same given data, I am satisfied that the preponderance of evidence is strongly in favor of the neurotic origin of the disease. The practical bearing of this conclusion lies in the rational explanation it affords of the treatment which we have discovered by experience to be the best, and in guiding us possibly in regard to our therapeutics in the future.

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100 STATE STREET.

CONGENITAL DISLOCATION OF HIPS; WITH REPORT OF CASE AND DESCRIPTION OF A PELVIS OBTAINED THREE YEARS AFTER SUCCESSFUL REDUCTION BY THE LORENZ METHOD.[1]

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It is not my purpose to go into a long historical sketch. A history of all the more important work done on this subject can be found in the classical monograph of Lorenz. Neither do I wish to waste time on the question of priority; and yet I cannot pass the matter by without the observation that after having made a rather careful study of the whole matter, it would seem to me that an entirely unprejudiced outsider could scarcely help being impressed with two facts, namely: (1) That Lorenz was the first to accomplish reduction and reposition in one sitting under deep narcosis by careful and intelligent manipulation instead of employing long-continued extension or the action of an unintelligent machine. (2) That he was the first to make use of the muscles extending from the pelvis to the femur, and the weight of the body in retaining the head in the acetabulum, and developing an acetabulum in the normal location, which later would become practically perfect functionally and anatomically.

In the early part of the year 1896 it was my good fortune to be present at a meeting of the Vienna Medical Society, when Professor A. Lorenz exhibited his first series of cases successfully treated by his "bloodless functional weight method." Later in the year I was granted the privilege of witnessing one of the first and most enthusiastic followers of Lorenz—Dr. Kuemmel, of Hamburg—successfully treat a number of cases of congenital dislocation of the hip.

To witness the work of such masters naturally aroused my interest in the subject and led me to attempt reduction in the cases that have since come under my care.

Frequency.—In reference to the relative frequency of congenital dislocation of the hip in proportion to population, or even to other affections, it is very difficult to obtain definite information. There are various factors which make such statistics quite unreliable. In the first place many of these cases have gone undiagnosed and are still overlooked. I have been able to find but two articles in which the author tried to establish the relative frequency of this affection

[1] Read before the Chicago Surgical Society, June 2, 1902.

to population. At the Paris Maternity, in 23,292 new-born this affection was observed only once. Of course, it must always remain a question as to how carefully it was looked for in the other 23,291 cases. One observer noted the condition three times in 332 autopsies on the new-born. In the Hospital for Ruptured and Crippled, New York City, it was observed twenty times among 9000 patients treated during the year 1890. Dallinger among 859 orthopedic patients observed the condition nine times, or in 1.1 per cent; Hoffa in 1444 orthopedic cases seven times, or in .49 per cent. At the Augustana Hospital, between May 1, 1897, and May 1, 1902, among 6296 patients I observed four cases. One observer states that it is the most common congenital dislocation, being about nine times as frequent as all others combined; another states that it is more common than clubfoot.

Though the above figures vary greatly, as they necessarily must according to the reputation the various surgeons have developed, they all agree in the one fact: that the condition is not at all uncommon — in fact, much more frequent than most of us have hitherto been inclined to believe.

Etiology.—As far as I am able to ascertain, but little is known of the etiology of this condition. The following causes are the ones most usually given: (1) Injury to mother during pregnancy, thus injuring fetus *in utero*. (2) Abnormally small amount of liquor amnii and consequent forced abduction and flexion of thighs during a long period of intra-uterine life. (3) Injury at time of birth. (4) Retardation of growth of the acetabulum.

The last is simply begging the question. The third is not probable, because it has been demonstrated over and over again that it is easier to produce a fracture at the neck of the femur than a dislocation of the hip at time of birth. The correctness of the first and second has so far been neither absolutely proven nor disproven; but that there must be some yet unknown factor at work is almost positive, because none of the above enumerated causes give us a clue as to why the condition should occur about seven times as often in girls as in boys.

Pathology.—All observers seem to agree that when present the acetabulum is always in the right place, and the most experienced state that however rudimentary the acetabulum may be, it is always present. If the patient is old and the dislocation consequently of long standing, the acetabulum is always more or less completely filled with cartilaginous, fibrous, or fatty substance. The head is usually of normal or nearly normal size, and consequently it is

always disproportionately large. The neck is usually short and thick, and often placed at an abnormal angle to the shaft. Sometimes the angle is greater and sometimes less than normal. The ligamentum teres may be absent, or it may be drawn out into a long, thin band. At times it is even hypertrophied. It is more often absent in double than in single dislocations. The capsule is necessarily greatly elongated and often has an hour-glass constriction at its middle. This constriction may be almost imperceptible, or it may be so pronounced as to nearly completely divide the capsule into two distinct halves. The capsule may be adherent to all or a part of the circumference of the rim of the acetabulum. In double dislocations the pelvis hangs on the femora by the drawn-out capsule instead of resting upon and being directly supported by the heads of the femora. The pelvo-femoral and pelvo-crural muscles are shortened, while the pelvo-trochanteric muscles may be lengthened in extreme cases.

Signs and Symptoms.—The signs and symptoms differ somewhat according to whether the dislocation is single or double. For convenience I have divided them into three groups.

Group one comprises those common to both forms of dislocations; group two, those which are found only in double dislocations; and group three, those which are found only in single dislocations.

Group 1: Prominence of the buttocks. This is sometimes very marked, having the appearance of a lipomatous tumor. The upper border of the great trochanter projects well above Nélaton's line. The head can be felt on the posterior surface of the acetabulum, and there is a depression instead of a prominence in the groin just external to the femoral vessels. If the pelvis is grasped firmly and traction is made on the thigh, the head can be felt to move downward without imparting motion to the pelvis—*i.e.*, undue passive motion at hip, though active motion is usually about normal. The patients learn to walk late, fall easily at first, are easily fatigued, and when they become very tired often experience a dull, aching pain at the hip and knee. A good skiagraph always shows the dislocation.

Group 2: Waddling, duck-like gait; more or less marked lordosis; prominence of abdomen; squat figure. The last can be determined by careful measurements. It can always be demonstrated that there is a disproportion between the distance from the anterior superior spines of the ilium to the internal malleoli and the height of the body.

Group 3: Marked limp; pronounced scoliosis; shortening of

affected limb as determined by measuring from anterior superior spine to internal malleolus.

Diagnosis.—If in each individual case of deformity of the hip or back we will but remember the possibility of its being a congenital dislocation of the hip, and recall the above enumerated signs and symptoms, the diagnosis is usually easy, as in each case all or nearly all of them can be found. In the past a goodly number of these cases have been diagnosed coccytis, simple spinal curvature, infantile paralysis, rickets, or Pott's disease. One of my cases had been diagnosed as infantile paralysis by several specialists, while another had been diagnosed as coccytis.

Until the advent of the *x*-ray quite a number of cases of coxa vara had been diagnosed as congenital dislocations of the hips.

Although these errors have undoubtedly often been made in the past, and are still occasionally made, they need not be made by those who in any way have had the subject called to their attention.

Treatment.—In order not to make the paper too long, I have decided to confine myself exclusively to a consideration of the "bloodless functional weight method" of Lorenz. Evidently for the sake of convenience and clearness this author has described his procedure as occurring in four distinct acts, namely: reduction, reposition, formation of acetabuli, and restitution of function. This ultraschematic arrangement gave me some trouble when I tried to adapt it to an actual case in practice. I gained the impression from my reading that these different acts should follow each other in regular order, but I soon found that some of them at least occur more or less simultaneously, as will readily be seen from the following:

Reduction is accomplished by traction upon the affected limb. In small children manual traction may suffice. The first important condition required is general anesthesia pushed to complete relaxation of the muscles. This accomplished, the pelvis is held firmly, while even, continuous, steady traction is applied to the limb, grasping it either a little above the ankle or a little above the knee. The pulling must continue until the upper border of the great trochanter is well down to the level of Nélaton's line. In older children a tackle and windlass arrangement becomes necessary unless one has several well trained assistants, and even then I think I should prefer tackle and windlass, as the amount of force applied can be more accurately gauged.

The perineum is placed against a firm, well padded support. For this purpose I have found an inflated Barnes bag the most satis-

factory. A piece of cotton is now placed about the limb just above the ankle, and a skein of wool is tied about this with a surgical knot so as to avoid constriction and impairment of circulation. The skein of wool is then fastened to one of the pulleys of the tackle, while the other pulley is fastened to spring scales and the scales to a fixed point in the room. The rope is fastened to the windlass, and this is now slowly set in motion. The scales are read every half-minute by one assistant, while another announces the frequency and character of the pulse every two minutes, and oftener if there is a sudden change.

If the reduction is very difficult it is necessary to interrupt the traction at intervals not to exceed ten minutes. As soon as the upper border of the greater trochanter is well down to Nélaton's line we may consider this part of the work accomplished and proceed to the next step, which consists in placing the head into the acetabulum. This is often the most difficult part of the procedure, and upon its accomplishment depends the future of the case. If we fail in this the case may be looked upon as one not suited for this method of treatment. If it succeeds we may have reasonable hope of ultimate success. The chief causes of failure seem to be: (1) The shortening of the adductor muscles; (2) hour-glass constriction of the capsule; (3) adhesions of the anterior portion of the capsule to the rim of the acetabulum. The first naturally interferes with abduction, which is so necessary in making the head slip over the posterior rim of the acetabulum. This difficulty is usually overcome by steady molding manipulations. If one but persists, he can in a short time abduct the thigh to a right angle. Sudden jerks must be avoided, as these are prone to cause fracture of the neck. If abduction to a right angle cannot be accomplished, subcutaneous or open tenotomy of the abductors must usually be resorted to. As soon as the required degree of abduction has been accomplished, the pelvis is steadied by an assistant, the thigh is flexed to a right angle and rotated inward slightly. While one hand of the operator presses on the trochanter the other hand makes strong, steady traction forward, and at the same time attempts slow abduction. The head slowly creeps up over the posterior border of the acetabulum, and suddenly slips over the rim and into the acetabulum with a distinct thud, which sometimes can be heard at a considerable distance; there is a vibration of the patient's body which is always transmitted to the operator, and sometimes even to the table and to those who may be in contact with it.

The other symptoms of an accomplished reposition are: Distinct

lengthening of the thigh; the development of a fulness in the groin and the disappearance of the head on the posterior surface of the ilium; and the sudden tenseness of the hamstring tendons characterized by the inability to extend the knee. The object of the inward rotation is to overcome the second and third great difficulties, namely, to loosen the capsule from the rim of the acetabulum, to utilize the head of the femur as a wedge to open up the hour-glass constriction in the capsule. Reposition having been accomplished, we must now make every effort that this be rendered stable. This is secured, first, by a boring motion: the thigh is rotated outward, and with a boring motion the anterior capsule is stretched and the acetabulum deepened; secondly, the tense pelvo-femoral and pelvo-crural muscles will help to deepen and enlarge the acetabulum; and finally, the weight of the body in walking will greatly aid the formation of a satisfactory joint in removing the deposits in the acetabulum and securing the development of a broad cotyloid ligament. In order to fully utilize this important principle a cast must be carefully adjusted. It is best applied over a pair of tightly fitting wool trousers, and should include the whole thigh and the trunk to the level of the navel. In order to avoid backward redislocation until the acetabulum has had a chance to develop, the cast is applied with the thigh slightly overextended, and a degree of abduction sufficiently great to secure against the possibility of the head slipping out of the rudimentary acetabulum. Usually about ninety degrees of abduction is required.

In single dislocations a high sole is now placed under the shoe of the operated leg, and the child is allowed to walk just as soon as it wishes. It will usually attempt to walk when the pain caused by the treatment has subsided. This will vary from one to two weeks. In double dislocation, where one hip is reduced at a time, exactly the same line of treatment is followed. The second hip can be reduced about a year after the first. If both reductions can be done at the same sitting a small stool is made for the child, on which it can sit astride comfortably and still bear some weight on the feet. The first cast is left in place for from four to five months, when it is removed, and the extremities are brought down to about forty-five degrees of abduction with slight flexion. This cast is left in place for about six to seven months more, when the child can usually be allowed to go without any appliances. During most of this time the child has been up and about. This form of ambulating treatment fulfils a threefold purpose: it develops a stable joint, secures normal motion in this joint, and during the entire

course of treatment the patient will secure enough exercise to keep in a healthy condition.

Prognosis.—If untreated, the prognosis is always bad. There remains an unsightly deformity which persists throughout life. That in itself is a serious affliction, especially for girls, who are the most frequent sufferers. But this is by no means all. The power of endurance is nearly always somewhat and often greatly reduced. The older the patient becomes, the less the endurance. Besides, there is no way of telling at the age of five, for instance, which child will get along fairly well and which one will be a great sufferer in later years. Lorenz quoted Halstead as stating that 31 per cent of all patients suffer pain, especially severe when fatigued. The pain may be slight, or it may be so severe as to incapacitate the patient for all work requiring walking or standing; or it may remind one of coccytis, as in one of our cases which had been repeatedly diagnosed. Bradford reports five cases in women in his own practice who suffered severe pain when they tried to walk a mile at a stretch. If the patient is submitted to the bloodless operation before the age of six in double and ten in single dislocations, the prognosis is very much better. In 212 carefully observed cases treated before January 1, 1899, Lorenz reports 108 anatomically and functionally perfect results, 102 anatomically imperfect but functionally good results. Julius Wolf, up to January 1, 1899, had treated 103 patients with 145 dislocations. Of these he reduced 115 joints in 96 patients successfully by the Lorenz method.

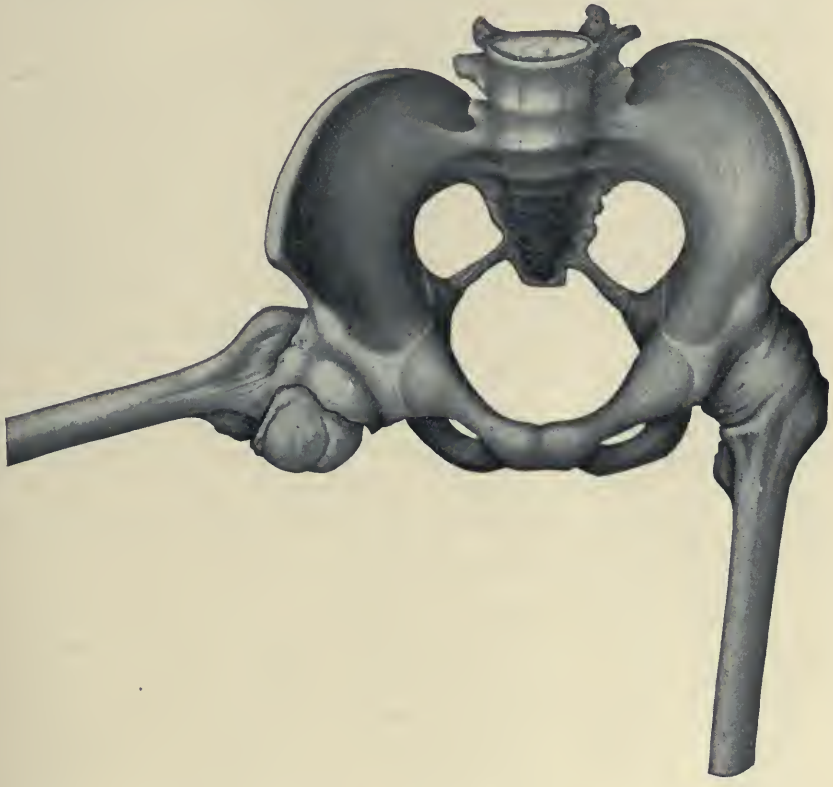
In 450 attempted reductions Lorenz had one gangrene of thigh, one death from chloroform, two from combined shock and chloroform, eleven fractures of neck of femur. This looks like a rather discouraging array, but we must not forget that all these accidents occurred in patients beyond the age limits above given and during the developmental period of this method of treatment. It must impress us with the necessity of great caution when the patient is older, and the duty we owe these patients in urging the reductions before the age limit is reached.

Within the proper age limit only the following minor accidents occurred: One fracture of the horizontal part of os pubis, one fracture of crista ilii, three peroneus paralysis. All of these subsided spontaneously.

There are still a few surgeons who deny the possibility of a bloodless reduction—yes, one or two who scoff at the idea. There are a greater number who, although admitting the possibility of a bloodless reduction, doubt the permanency of the cure. In order to

do my mite in convincing these I take the liberty of describing a pelvis obtained from a patient who died November 27, 1901, at the age of seven years and four months, upon whom I had done the Lorenz bloodless reduction on both hips about three years previously.

I will not give a detailed history, but simply state that the functional result was perfect. As to the anatomical result, I will let the specimen speak for itself. On examining it carefully we note the



following facts: The pelvis is well formed and apparently of normal size. The individual bones of which it is composed are held together firmly by strong ligaments. The capsular ligaments are well developed and hold the heads firmly in the acetabula. No abnormal sliding motion is possible. The heads of the femora are opposite the Y cartilage. A straight line drawn through the two Y cartilages passes apparently directly through the center of the heads and about half a centimeter below the upper borders of the great

trochanters. The upper borders of the heads are well below the anterior inferior spines of the ilia. The lower borders of the heads project fully half a centimeter below the level of the iliopectineal eminences. So far this description tallies almost perfectly with that of a normal pelvis which I obtained from a female patient about eight years of age. In the latter the Y cartilages seem to be relatively a little nearer to the anterior inferior spines.

In order to determine the condition of the reduced joint itself I opened the right one by a semilunar incision, severing the capsular ligament for about the lower half of its extent. The neck is strong, of about normal length; the angle between it and the shaft may be a trifle less than that of ordinary femora. The head is a little larger than normal, not perfectly globular, but on its anterior inferior and mesial surface it has the appearance as though a shell of a small sphere had been superimposed. The whole articular surface is covered by a smooth layer of cartilage. The capsular ligament is strong and hugs the head and neck closely. The acetabulum is well developed, almost if not quite as deep as normal; it has a well formed solid rim. The cotyloid ligament is present and apparently normal. The articular surface is smooth. There is no definite ligamentum teres.

At the bottom of the acetabulum I found a thin, paper-like structure about 4 millimeters wide and 1.5 centimeters long, one end attached at the place where the ligamentum teres is normally inserted in the acetabulum, and the other end free. Whether this may be looked upon as the remnant of the ligamentum teres I am unable to say.

I believe that the reduced joints will bear the most careful comparison and most rigid scrutiny, and will convince even the most skeptical that we have obtained an almost perfect anatomical result: joints which would always have remained stable, which would have supported the weight of the body under all ordinary circumstances, and which would permanently have insured a perfect functional result.

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THE NEUROLOGIC DIAGNOSIS OF TRAUMATIC LESIONS OF THE SPINAL CORD.[1]

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The preliminary difficulty frequently in the way of a neurologic diagnosis in traumatic lesions of the spinal cord is the want of consideration of the anatomic elements of the cord and their functions. The recent conception of the neurone has greatly simplified our knowledge and the physiologic interpretation of cord phenomena. When Waldeyer, in 1891, proclaimed the doctrine of the neurones he opened the way for, and crossed the threshold of, exact knowledge of minute anatomy of the cord, which with assistance of the refinement of histologic technique has developed wonderfully the understanding of its structure. With the accumulation of this all-important knowledge, to be used as the fundamental basis for clinical work, there has been a corresponding increase in our knowledge of the disease of the cord.

For the purpose of simplifying diagnosis it will be necessary for me to briefly state the essentials of the anatomy of the cord and such clinicopathologic facts as may contribute to the formulation of a working plan. The cord is made up of segments, thirty-one in number, superimposed one upon the other, continuous in function one with the other, with no line of demarcation between the segments, united in the nervous pathways: these pathways have for their function the transmission of impulses from the cortex of the brain to the end organ in the periphery, and *vice versa*. These pathways are not continuous, however, but are made up of communicating neurone complexes, each individual neurone complex retaining its physiologic and anatomic independence. Thus there are pathways which consist of two, three, or even more successive neurone complexes (Jakob). These important pathways are primarily divided into the motor and sensory paths.

The motor pathway or tract has two neurone complexes, viz., the central or higher level neurones, from the cells in the cortex to the anterior horns, or to the nuclei of the motor cranial nerves; and the peripheral or lower level neurones, which are the terminal fibrils extending from the anterior horn of the spinal cord or cranial nuclei to the individual muscle fibers. This is the direct motor pathway,

[1] Read before the Illinois State Medical Society at Quincy, Ill., May, 1902.

while the indirect motor pathway concerned in coördination of muscular movements and the higher reflex and automatic movements are much the same in the arrangements of the neurone complexes.

The sensory pathway is made up of at least three and probably more neurone complexes. The direct peripheral neurone transmits impulses from the sensory end organs to the cells of the spinal ganglia, thence by the posterior roots to the spinal marrow. Here the central or higher level neurone complex is met, which in its complex route finally reaches the cortex of the brain. The indirect neurone complex by a different route finds its terminus in the cortex. The direct sensory pathway transmits tactile, pain, and temperature impressions, while the indirect sensory pathway transmits the coördinative sensations from the muscles, joints, and viscera. "The motor and sensory pathways communicate with each other at two places in their course: first, in the cortex of the brain, in the reaction of consciousness; and secondly, in the reflex tracts which are not under the domination of the will."

These several pathways or neurones group themselves in columns in the spinal cord, viz., the anterior, posterior, and lateral columns. Along their route at certain levels (called segments) nerve bundles are given off—these processes or bundles emerge from the cord as nerve roots. There are two roots to each nerve, each having a separate exit from the cord, the motor root coming from the anterior columns and the sensory root from the posterior columns; they unite outside of the cord to form the spinal nerve. Each segment of the cord gives off a pair of nerves. There are thirty-one pairs of spinal nerves, corresponding to the segments of the cord, viz., eight cervical, twelve dorsal, five lumbar, five sacral, and one, or rarely two, coccygeal. Each segment is named after the pair of nerves which arise from it, and not from the vertebra at the level of which it lies (Butler).

By reason of the varied anastomoses of the spinal nerves with each other the nerve may contain fibers, motor or sensory, from several different segments, as is the case in most of the spinal nerves. This is an important fact to remember in spinal localization. Each segment is regarded as a unit possessing certain motor, sensory, trophic, vasomotor, and reflex functions with reference to the peripheral distribution of the nerve roots which pass from it and enter it. The study of the relationship of the spinal segments bearing the names of regional levels to the vertebra is important, because it is self-evident that all of the spinal segments are not opposite the vertebra corresponding in name; again, the infraspinal course of

the nerves after they emerge from the cord is longer the lower we descend the cord. This is noted especially in the cauda equina made up of nerves from the lumbar and sacral segments, which have a long infraspinal course before they emerge. Excellent diagrams have been made by progressive authors showing the relation of the segments of the spinal cord and of the roots and exits of the spinal nerves to the spinous processes of the vertebræ. Again, it is important to study the localization of the functions of the segments of the spinal cord in order to be able to localize the lesions, taking of course into consideration all contributing symptoms which serve to make up a diagnosis. A mass of clinicophysiologic and pathologic facts have been compiled into a most elaborate table by Dana, which, based upon the observations of Starr, Dana, Mills, Thorburn, and others, may be regarded as the authoritative guide of to-day.

In order to consider the differential diagnosis of cord lesions, it is necessary to apply these anatomic, physiologic, and pathologic facts. This is best done by considering the general symptoms of injuries to the spinal cord.

Physical Diagnosis.—It is of the first importance to get a full history of every case before attempting to consider the special diagnosis of the lesions of the spinal cord. The history will oftentimes proclaim the nature of the injury and relieve, in a great measure, that seeming mystery which too often enshrouds spinal cord lesions. First, it will give a clue whether or not the spinal column is injured. This complication, with all of its attending possibilities, is a factor which may demand more extensive exploratory inquiry. Secondly, it enables us to estimate the nature of the lesion. Thirdly, it can contribute to the differentiation when the surgeon and neurologist are not wholly in accord, as in injuries from falls from heights or the concussion noticed in railroad and elevator accidents. This difference between surgical and neurologic diagnosis occurs from the absence of external evidences of vertebral injury, and the very prominent presence of symptoms indicating extensive injury to the cord. These cases are more or less obscure and diagnosis is difficult; in fact, recovery may take place and the real lesion may never be known. In the event of death, the examination of the cord will doubtless clear up the diagnosis, but even then it may require microscopic study to throw light upon the symptoms, especially when the heart, respiration, and vasomotor symptoms are prominent. The next step of importance in neurologic diagnosis is inspection; this will lead to the probable location of the site of the lesion where the

spinal column is injured, and thus lead to the localization as to the level of the lesion in the cord. Inspection, however, is necessarily limited in its scope, as we must depend on the more thorough and exhaustive inquiry by special means and methods as to the site and extent of the cord injury.

Symptoms.—There are three primary divisions of symptoms: (1) motor; (2) sensory; (3) reflex.

The motor symptoms of traumatic diseases of the spinal cord are shown in complete or partial motor paralysis, or a greater intensity of motor activity, as in spastic states, rigidity, contractures, spasms, etc.—in fact, every degree of exalted action, from slight variation from normal health to the most extreme demonstrations of muscular activity; in advanced cases, trepidations and cloni in various situations.

The sensory symptoms are evidenced by changes in the tactile sense, temperature sense, pain sense, muscular sense, articular and tendinous senses.

Motor Symptoms—Paralysis.—Location determined by type of paralysis.

Upper motor neurones (the corticospinal complex), if involved, produce spastic paralysis of all extremities; the paralysis is incomplete, but equally distributed to all of the muscles. No wasting from disease, but from disuse. Electric reactions are negative, the muscles are in high state of irritability, slight touch causes marked contractions; there are increased reflexes deep and superficial, and ankle clonus.

When lower motor neurones are involved, paralysis is due to disease of the cells of the peripheral motor neurones in the anterior horn of the cord characterized as follows: the muscles are flabby, relaxed, atrophied; R. D. is present; there is loss of deep reflexes; no spasticity, but may have contractures; the muscular grouping is according to certain segments in the cord.

Sensory Symptoms.—In the study of sensory symptoms great care must be used, for as Mills well says, "the study of cutaneous sensations requires time, patience, and method, and unless done carefully the results are worthless, particularly for tactile sensibility. An analytical study necessitates the use of all methods that will determine cutaneous sensibility. The personal equation is to be considered, for abilities of discrimination vary with individuals."

The sensory symptoms, as before stated, are changes in the tactile sense, temperature sense, pain sense, muscle sense, articular and tendinous senses. Gordinier says: "(1) The tactile and mus-

cular sense impressions are conveyed via the posterior nerve roots in the posterior columns; the muscular sense impressions pass up the same side, while the tactile cross over and upward on the opposite side; hence, a lesion of the posterior columns will produce anesthesia and ataxia of one or both sides. (2) The sensory tracts of the cord which transmit sensations of pain and temperature are Gowers's anterolateral ascending tract of the side opposite to the point of entrance, the sensations being carried by collaterals from axones of the cells of the posterior spinal ganglia (posterior nerve roots) to cells existing in the central gray matter of the same side, the impulses being farther conveyed by the axones of these latter cells through the anterior commissure to Gowers's tract of the opposite side. A lesion, then, of the central gray matter usually causes a loss of these senses, producing analgesia and thermoanesthesia on one or both sides." Owing to the fact that all forms of sensation are conveyed to the cord by means of the posterior nerve roots, a lesion of these roots at their junction with the cord, or in the columns of Burdach, will occasion at first irritative symptoms, paresthesia, neuralgic pains, ataxia, and later anesthesia, analgesia, and thermoanesthesia.

Sensory Localization.—It must be remembered that the peripheral sensory nerves anastomose so freely that to get a total anesthesia of any part of the skin the sensory fibers from two adjacent segments of the cord must be destroyed. Walton (*Journal of Nervous and Mental Diseases*, vol. xxix, No. 1, p. 6) thus summarizes the distribution: The upper roots of the brachial plexus supply the cap of the shoulder and the radial side of the arm and hand, while the lower roots supply a strip down the ulnar side of the arm and hand. The seventh dorsal segment supplies the ensiform region, the eleventh dorsal the umbilicus and the lumbar, the front and outer and inner aspects of the thigh to the knee and the inner aspect of the leg. The sacral supplies the region below the knee in front on the outer aspect as well as the whole or greater part of the foot; it supplies also the back of the leg and a strip in the middle of the posterior surface of the thigh, and the saddle-shaped area, the perineum, scrotum, and penis. The fourth cervical segment furnishes sensations down a line below the clavicle adjoining the distribution of the second dorsal. The absence of representation on the trunk of the intervening segments is explained by the fact that in the budding and growth of the upper extremity the areas supplied by the fifth, sixth, seventh, and eighth cervical and the first dorsal are carried down the arm (this is illustrated in diagram). For a

similar reason the twelfth dorsal closely approximates the third sacral on the buttock. Sherrington says: "It is probable that complete anesthesia in any area implies loss of the segments above and below the one which supplies that area, as each part of the body receives sensory fibers from these segments."

"In case the roots are crushed at the same level as the cord, the anesthesia will reach to the level of the lesion." Kocher calls attention to the strip of hyperesthesia which surmounts the anesthesia and points to root irritation.

Incomplete anesthesia signifies incomplete lesion of the cord. Varying areas of anesthesia also indicate incomplete lesion.

Pain.—The pain in organic disease of the spinal cord is usually localized, and seldom varies in its localization.

Pain in the region of the sixth to twelfth dorsal vertebræ, posterior iliac spine, and coccyx, should be differentiated from hypersensitive, hysterogenic zones.

Pain is never referred to a point above the seat of lesion; it is usually referred below the seat of lesion when nerve fibers alone are involved, and at the seat of the lesion when the roots are implicated. Horsley says that the localization of pain tends to be too low. Development of sudden tearing, burning pain creeping rapidly up is caused by hemorrhage, either in the membranes or rarely in the cord.

The root pain, commonly called girdle pain, or sensation, is significant of inflammation, or degenerate changes in the cord itself, and while the posterior nerve roots are in a state of irritation, yet this irritation differs from that commonly experienced in disease in the vertebræ, as caries, or in growths like tumors, which irritate the conducting fibers. The girdle sensation is distinctive in that it is a painful feeling of constriction, of tightness, or, as one patient expressed it, his skin was too tight for his abdomen. This sensation is usually limited in width, as it occurs in the locality just below the healthy region of the cord, where the damaged portion begins. It is indicative of a transverse lesion of the cord, and is of localizing value.

Pain is not as frequent in traumatic lesions as in new growths. Pain of new growths is a root symptom, and is burning and stabbing in character.

Posterior nerve roots are often diseased by degenerative processes that involve posteroexternal columns and give rise to similar and sometimes identical symptoms—with the exceptions that pain is often a prominent feature in nerve-root disease, the path for painful

stimuli being contained in these roots—while it is open to question whether disease limited to the posteroexternal columns causes pain.

Posterior nerve roots when irritated cause hyperalgesic skin areas corresponding to the irritated roots. The pain is often severe and persistent.

Reflexes.—The study of reflexes is of great importance—in fact it may be said the condition of the reflexes is an index to diseases of the cord. This is explained by the fact that the entire reflex tract is limited to the peripheral or lower level neurones. This tract or arc is made up of a sensory portion contributed by the sensory peripheral neurone, a motor portion contributed by the motor peripheral neurone, and a connecting link formed in the spinal cord by a branch of the sensory neurone known as the reflex collateral. It is a short process of the posterior roots passing to the motor cells in the anterior horn. The cutaneous and tendon reflex arcs are the best known and the most simple, while the more complex are not yet definitely known. The reflexes are important symptoms. If they are lost, diminished, or exaggerated, we know that ordinarily we may say that the cord, at least in the section under consideration, is diseased. The cutaneous reflexes vary with individuals, so that when lost or diminished we cannot put too much reliance upon their value. The presence of the reflex, however, is of value, as it shows an intact condition of the arc in the segments upon which it depends.

The knee reflex phenomenon is of the most value clinically in spinal injuries. Immediately after a severe contusion to any part of the cord, the knee-jerks may be very much diminished or unobtainable. If the injury is above the lumbar region, the absence of the knee-jerk alone is not sufficient evidence for a total transverse lesion, for with the resorption of blood, and recovery from shock to the nerve fibers and nerve cells, the knee-jerks, though they were absent at first, may return or become more exaggerated. If the knee-jerks have not returned by the end of a week or ten days, however, it is certain that the lesion is extensive and severe. In lesions in the lumbar region and lower down, both in the cord and in the nerve plexus, the knee-jerk is less reliable as an index of the extent of the injury; for these regions are the seats of the knee-jerk's mechanism, and even partial injuries here are very likely to destroy it (Pearce Bailey). The exaggeration of the knee-jerk shows that the arc itself has not been destroyed, but that the lesion is situated above the second and third lumbar segments, and the exaggeration is due to cutting off the inhibiting cerebral impulses, or that the gray substance of the cord is disturbed by inflammatory

or trophic changes. Both causes may act in conjunction and produce very active exaggeration. The loss of the reflexes indicates disease in either anterior or posterior fibers or both. It is by noting the associated symptoms that the real significance of the absence of the knee-jerk is ascertained.

In considering the value of reflexes of the cord it is well to mention here the Babinski reflex. Babinski called attention to the fact that in lesions of the pyramidal tract (the motor pathway) irritation of the sole of the foot produces extension of the great toe. The toe is extended instead of flexed, which usually results in the plantar reflex. Other observers have confirmed the value of this reflex, which is now regarded as reliable and always investigated in spinal cord cases, especially in differentiating organic disease. Walton says it may appear in spinal fracture when no other reflex is present.

Other reflexes and their significance as compiled by Golebiswski are:

1. Plantar reflex: Contraction of the muscles of the foot on irritation of the sole (lower part of the lumbar enlargement).

2. Gluteal reflex: Contraction of the gluteal muscles on irritation of the skin of the gluteal region (fourth to fifth lumbar segments).

3. Cremaster reflex: Retraction of the testicle on irritation of the skin on the inner surface of the thigh (first lumbar segment).

4. Abdominal reflex: Contraction of the abdominal muscles on irritation in the region of the linea alba (eleventh dorsal segment).

The superficial reflexes are generally lost or diminished in spinal fracture and always lost in complete lesion (Walton).

Other neurologic symptoms associated and of value are: Ankle clonus is significant of profound organic change in the cord unless associated with evidences of neurasthenia or hysteria. The dissociation of sensation is said by Sachs (New York Neurological Society Proceedings, Oct. 1, 1901) to be an exceedingly valuable symptom as indicative of moderate involvement of the cord. It is a root symptom and not necessarily an indication of absolute involvement of the cord itself. Disturbance of the muscle sense as found in incoördination, purposeless movements, etc., when disturbed in traumatic cases, and especially when associated with articular and tendinous senses, indicates transverse lesion of the cord.

Localization by Segmental Levels.—It is rare that a lesion of any consequence in the cervical region is not followed by serious results, by reason of its having within its scope very important nerve centers. In total transverse lesions death is sure to follow because of involvement of the phrenic nerves and consequent respiratory paral-

ysis. In partial lesions (unilateral) the phrenic nerve of one side is paralyzed, and as a consequence respiration ceases on one side—the thorax does not move and no breath sounds are heard, while the diaphragm lies higher than on the normal side. Another danger confronting the patient is that of hypostatic pneumonia, from which recovery cannot be expected. Bruns and Winscheid say that in lesions of any part of cervical enlargement, erection of the penis is very frequent. Injury to the upper part of the cervical cord causes a spastic paralysis of all four extremities, and the muscles of the head will be implicated. It may be said that the higher up the lesion, the sooner death is to be expected in cervical injuries. Total transverse lesions of the fifth cervical segment cause complete loss of power of all muscles supplied by the brachial plexus. Albert in his recent work on Surgical Diagnosis, in speaking of fracture in the region of the brachial plexus says: "It must be emphasized that fractures in the region of the origin of the brachial plexus may cause complete paralysis of the lower portion of the body, and yet the upper extremities may escape all injury, or, at best, merely suffer incomplete paralysis, for instance, of one arm or both forearms."

The following symptoms are common to all lesions of the cervical region of the cord:

1. Vasomotor disturbances.
2. Oculopupilary symptoms.
3. Disturbances of reflex action.

Vasomotor symptoms vary from slight flushing of the skin to very copious and continued perspiration, which may involve the face when the lower cervical is injured. Vasomotor symptoms are common, says Gowers, irrespective of the seat of the lesion. These changes are shown in slight warm to cold, pale, and livid extremities. There is disturbance of the thermal sense. Wagner and Stopel report a very high temperature.

Oculopupilary Symptoms. — Both pupils are affected in bilateral lesions, and only one pupil, and that on the same side, in unilateral lesions. These changes are due to injury to the cervical sympathetic.

Lesions of the Dorsal Region. — The following symptoms are found: Girdle pain, a hyperesthetic zone corresponding to the level of the lesion; spastic paralysis of the legs, usually in extension, more rarely in flexion; patellar and ankle clonus; often marked so-called spinal epilepsy; anesthesia up to and including the diseased segment; always preserved and often increased cutaneous reflexes; variable disturbances of the reflex functions — difficult

micturition with violent tenesmus, sometimes involuntary evacuation, frequently retention of urine or paradoxical ischuria; constipation; subsequently bed-sores, cystitis, etc.

The persistent symptoms of partial lesions of the cord are: Disturbances of sensation; sensitiveness of the spine or the spinous processes; disturbances of mobility of the spine, frequently attended by inability to stoop; disturbances of gait.

Total transverse lesions of the dorsal region are usually fatal, death following either soon after the injury or later in consequence of lung or bladder complication. Partial lesions are not necessarily fatal, as recoveries usually follow with persistent disturbances as before stated.

Lesions of lumbar and sacral region are shown principally in involvement of the cauda equina, as the cord itself does not extend below the first lumbar vertebra; the symptoms vary with location and extent of the lesion. The phenomena of injury in this locality are usually uniform and distinctive.

The motor paralysis involves the sciatic and pudic, the anterior crural and obturator nerves. The paralysis varies in severity, in consequence, and R. D. varies with the extent of the injury.

The anesthesia follows the distribution of the great and small sciatic and pudic nerves.

When the fourth and fifth sacral roots alone are involved, then the anesthesia is limited to the perineum, genitals, and gives rise to the saddle-shaped area on the buttocks and thigh.

Sometimes it is difficult to get distinctive local indications, and hence it is not always possible to differentiate injuries to the cauda equina.

Herter gives as an aid the following suggestions: Anesthesia limited to the buttocks (saddle-shaped area), or to buttocks and back of the thigh, or to the buttocks, thigh, and legs (posterior aspect), suggests cauda equina injury; also small loss of motor power with considerable sensory involvement suggests cauda lesion.

Pain *in* the area of anesthesia points to cauda equina lesion, and pain *above* the area of anesthesia a cord lesion.

The pain of cauda injury is referred to the sacrum rather than to the lumbar region.

When the cornus medullaris is involved it intensifies cauda lesions — causes paralysis of the bladder and rectal sphincter and loss of sexual power.

Anterior Root Symptoms.—Irritation anterior nerve root symptoms give rise to overactivity.

The muscular areas involved correspond to the segments involved.

Acute irritative lesions are marked; they may exist independent of motor paralysis.

Electrodiagnosis.—The first essential to diagnosis of cord lesions is a knowledge of motor points. As each neurone is an independent unit, the degeneration is limited to the neurone or neurones so affected. The muscle fiber intimately connected with a peripheral neurone will degenerate with it. If, then, we elicit certain muscular phenomena of a pathologic nature by stimulating a nerve at its known motor point, we at once distinguish this from a like pathologic condition of the central neurone. Knowing the point of emanation of each nerve from the cord, localization of the lesion becomes a simple matter.

Responses to electrical stimulation are of two kinds, motor and sensory. The first of these can be again divided into quantitative and qualitative. Quantitatively, we have increase of excitability or diminution of excitability. (1) Increase of excitability is not of very great practical importance, as it indicates merely some actual molecular change of some part of the nervous system—either an irritation in the centers of the parts examined, or a loss of the inhibitory influence of the brain upon peripheral tracts. Of affections of the cord, an augmented state of excitability is found occasionally in locomotor ataxia, in early stages of progressive muscular atrophy, and in simple cases of transverse myelitis. (2) Although diminution of excitability has been observed where the musculature has been rendered inactive for some time, from traumatic causes and in true muscular hypertrophies, as well as in polymyositis progressiva, it is of little practical value because we have in the reaction of degeneration a surer means of diagnosis.

A degenerated muscle exists wherever we have a degenerated nerve. Such a muscle responds to electric stimulation with a pathologic reaction, known as the reaction of degeneration, the most important feature of which is the torpid quality of the muscular contraction upon galvanic stimulation. The seat of the pathologic condition producing R. D. is always the neuraxon and muscle; the nerve may be affected in any part of its course—*i.e.*, spinal nuclei in the anterior horns, anterior roots, and peripheral branches. R. D. is never present in pure muscular disease. R. D. is encountered in affections of the motor nerve roots, in affections of the anterior horn cells, and in progressive muscular atrophy of spinal origin. R. D. is always a sign of *organic* disease.

Sensory responses to electrical stimulation are of very slight value. However, in tabes there may exist a faradic analgesia without any sensory loss to other forms of stimulation. These methods show us that a lesion is present, that it is not in the central neurone, but in the cord or its branches, and that it is in a certain definite locality.

Differential Diagnosis.—Whether lesion is partial or complete. The symptoms of partial lesions, according to Wagner and Stolper, are:

1. Motor and sensory disturbances having an unequal distribution.

2. The two sides of the body are especially liable to be unequally affected (asymmetric paralysis). I have seen one such case accompanying injury to the cord without apparent fracture.

3. There are signs of both motor and sensory irritability.

4. The patellar reflexes are present in almost all cases. They are usually exaggerated and are often unequal as to the two sides (they are never permanently lost).

5. Partial or complete restoration of functional power takes place within one or two weeks.

The symptoms of total transverse lesions as given by the same authors are:

1. Motor and sensory paralysis, equally marked on both sides of the body.

2. Loss of all nervous irritability in the region affected by the paralysis.

3. Loss of the patellar reflexes.

In addition we find,

4. Paralysis of bladder and rectum.

5. Vasomotor paralysis.

DIFFERENTIATION BETWEEN DESTRUCTIVE AND IRRITATIVE LESIONS (GRAY SUBSTANCE OF THE CORD).

Destructive (anterior horns):

1. Motor paralysis.

2. Degenerative atrophy.

3. Reaction of degeneration.

4. Loss of reflexes.

5. Absence of sensory symptoms. (If sensory symptoms are present it shows further involvement of the segment.)

Posterior horns:

Destructive disease limited to posterior horns is rare, usually associated with irritative disease.

Loss of sensibility to pain and temperature is doubtful if tactile sensibility or muscle sense is disturbed.

DIFFERENTIATION BETWEEN DESTRUCTIVE AND IRRITATIVE LESIONS (WHITE SUBSTANCE OF THE CORD).

Destructive:

1. Loss of voluntary power below the level of the lesion.
2. No degenerative atrophy.
3. Excessive reflex action, increased knee-jerks, often ankle clonus.
4. Spasm or rigidity of muscles below seat of disease.

Two clinical types of paralysis produced by destructive lesions according to location of lesion: (1) Atrophic spinal paralysis; (2) spastic spinal paralysis. (The clinical features of these forms sometimes blend.)

Posteroexternal of the posterior columns of the cord:

1. Incoördination in the extremities below level of the lesion.
2. Loss of tactile sensibility varying in distribution (usually chiefly in the legs) according to the vertical extent and position of the lesion.
3. Diminution or loss of reflex action (loss of knee-jerk if the lesion is in the lumbar region).

Posterointernal columns:

There is little clinicopathological evidence of disease in this locality, which is believed to give rise to disturbance of coördination or of equilibrium, and may be masked by the incoördination which follows lesions of the posteroexternal columns.

UNILATERAL LESION (GOWERS'S TABLE).

Zone of cutaneous hyperesthesia. Zone of cutaneous anesthesia.	Lesion.	
Motor palsy. Hyperesthesia of skin. Muscular sense impaired. Reflex action first lessened, then increased. Temperature raised.		Muscular power normal. Loss of sensibility of skin. Muscular sense normal. Reflex action normal. Temperature same as that above lesion.

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BOOK REVIEWS.

DIPHTHERIA, MEASLES, SCARLET FEVER, AND GERMAN MEASLES. By W. P. Northrup, M.D., and Prof. Dr. von Jurgensen. Edited with Additions by W. P. Northrup. Price, $5.00. Philadelphia and London: W. B. Saunders & Co. 1902.

This volume forms the third of the series of English translations of the Nothnagel System of Practical Medicine. The article on diphtheria is contributed by W. P. Northrup and is a most exhaustive study of the special pathology of this disorder. The illustrations are especially valuable, showing the methods of treatment, intubation, tracheotomy, etc. The serum treatment is especially commended, and the quoted statistics show that the earlier the serum is administered the lower the death-rate. There is a complete historical *résumé* of O'Dwyer's intubation method. All other methods of treatment are mentioned, and the importance of proper nursing and feeding in this disease is emphasized. The chapter on diphtheria forms a monograph which deals with every phase of the subject from a modern and practical standpoint.

Von Jurgensen discusses the acute exanthemata, opening with an introduction which describes what is common to them all. The clinical description of the various disorders is adequately given. In discussing scarlatina the work of Class is referred to, but no opinion is passed on the probability of his having discovered the germ of the disease. German measles and the "fourth disease" are adequately treated in a short appendix. The work is issued uniformly with the other volumes of the series.

PRACTICAL DIETETICS. With Special Reference to Diet in Disease. By W. Gilman Thompson, M.D. Second Edition, Enlarged and Thoroughly Revised. New York: D. Appleton & Co. 1902.

Without going too much into detailed description of this work, we will indicate its contents and briefly state that we regard it as the best work upon dietetics in the English language. In the introduction Bennett is quoted: "Of all the means of cure at our disposal, attention to the quantity and quality of the ingesta is by far the most powerful." While concurring in this view, the writer distinctly disclaims the advocacy of any dietetic system as a cure-all, as well as the specific influence of any one food in disease. That the subject of dietetics has not received the attention which it merits is attested by the quotations from some of the standard treatises on the practice of medicine, in which the subject in relation to given diseases is disposed of by some of the following phrases: "The value of nutritive diet requires mere mention;" "The patient should be carefully fed;" "General dietetic treatment is of primary importance."

We quote from the introduction to the first edition: "A writer of wide experience in practical dietetics: 'At present there are comparatively few persons who are called upon to feed the sick to whom a glass of milk or a pound of beef represents any definite amount of food materials. Still fewer can tell how much food value a glass of lemon jelly or wine whey represents, and yet the adult patient is dependent upon the attendant even more than the week-old

infant for the requisite nutrition.' The present volume has been prepared with a view of making good such deficiencies, by furnishing a text-book in which the practitioner of medicine may find detailed the appropriate diet for each disease which is at all influenced by right feeding."

Part I deals with food and food preparations, and considers food classification, force production especially as related to the different classes of foods, salts, proteids, carbohydrates, and fats.

Vegetarianism is disposed of by the statement that on a vegetable diet one may live in apparent health for some time, but it eventually results in a loss of strength and of the general resisting power against disease. Most of the alleged benefit of vegetarianism is due to the greater freedom of movements of the bowels, induced by the ingestion of coarse foods. Animal food is said to be absolutely essential for all vigorous races.

The various substances commonly employed in human alimentation are described. There is a separate chapter upon stimulants, beverages, and condiments, and another upon food preservation and upon the quantity of food required. The remaining and larger portion of the work is devoted to a description of foods for the sick and in special diseases.

PROGRESSIVE MEDICINE. Edited by Hobart Amory Hare, M.D., Assisted by H. R. M. Landis, M.D. Volume II, 1902. Philadelphia and New York: Lea Brothers & Co.

The June issue of Progressive Medicine is uniform with the volumes which have preceded it, and contains 442 pages. W. B. Coley contributes the article on the surgery of the abdomen, including hernia. Among the more important articles discussed by him are penetrating shot wounds of the abdomen. The question of non-intervention is gone into at length, and the conclusion is drawn that operative interference should be resorted to as soon as possible after a penetrating wound of the abdomen, and that this will save the largest proportion of lives. In speaking of traumatic hernia, Bilfinger is quoted as coining the statement, "hernia on a traumatic basis." These are regarded as comparatively frequent. They must, however, develop immediately after or within a few days of the onset of an injury, and there must be no predisposition to hernia. Other writers regard the development of a hernial sac on this purely traumatic basis as extremely rare.

Under operations for hernia, McArthur's "auto-plastic" suture is described, but it is no longer thought to be of much service, as the methods of sterilizing absorbable materials are now so perfect.

In the article on appendicitis the author leans to the view that early operation is indicated in all cases, and quotes so much of the recent literature as supports this view. The valuable series of cases by Ochsner and those who take an opposite view, as to the advisability of operating in acute appendiceal inflammations, are omitted.

The article on gynecology is contributed by John G. Clark. The treatment of purulent collections in the pelvis, with the varying views as to its management, is given. The study of Schauta's cases leads to the conclusion that vaginal operation is the one of election for purulent collections in the appendages. The abdominal operation is indicated in those cases in which the vaginal operation is technically impossible. Vaginal incision is an operation of necessity and can never rival the radical operation.

Alfred Stengel writes the chapter on diseases of the blood and ductless glands. In this department the writer says that comparatively little has been added to our knowledge of diseases of the blood during the past year. Some facts of importance have been discovered in the morphological studies of the corpuscles, and some added information on the chemistry of the blood. To counterbalance these, many notable articles have been added to the serum and its reaction. This subject is now becoming so complex that the time is almost ripe for a separate subdivision of serum diseases.

Edward Jackson contributes the article on ophthalmology.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of Gustavus P. Head, M.D. Volume VI: General Medicine. By Frank Billings, M.S., M.D., with the Collaboration of S. C. Stanton, M.D. The Year-book Publishers. 1902.

The plan followed in this, the second volume on general medicine issued within the year, is to present abstracts of sufficient length to embody the main facts contained in the abstracted article. This seems to have met with the approval of the majority of the readers. The practice which has been too prevalent in synopses of the literature of trying to present abstracts of all that is written is in this manner avoided, and there is only considered so much as is of importance in the progress of the science. A too brief abstract is often worse than none, and may create the impression that the original article is of no value, or may give a positively false notion of its contents, either of which may lead to a neglect of a valuable contribution, or else time will be wasted in consulting something which is of no importance. The more important articles in the current volume are those upon yellow fever, malaria, dysentery, diseases of the pancreas, and gall-stones and diseases of the biliary ducts. American medicine is to be congratulated upon the important part it has taken in the development of these subjects, notably the transmission of yellow fever.

DISEASES OF THE NOSE, PHARYNX, AND EAR. By Henry Gradle, M.D. Price, $3.50. Philadelphia and London; W. B. Saunders & Co. 1902.

This is an excellent text-book on diseases of the nose, pharynx, and the ear. It has 547 pages, and is an accurate description of this special department of medical science. It is adequately illustrated, containing numerous plates on the anatomy of the nose and frontal sinuses taken from Hajek's excellent work.

MANUAL OF CHILDBED NURSING, WITH NOTES ON INFANT FEEDING. By Charles Jewett, A.M., M.D., Sc.D. Fifth Edition, Revised and Enlarged. Price 80 cents. New York: E. B. Treat & Co. 1902.

Jewett's Manual of Childbed Nursing has a deserved popularity. It is a short, concise statement of the essential features in the care of the lying-in woman and the infant. It has been written especially for nurses, but practitioners will find much in it that is practical and suggestive. As the writer says in the preface, it has not been his aim to furnish a text-book, but rather to aid the nurse in remembering the more important practical teachings of hospital training.

LEADING ARTICLES.

MEDICAL ART VERSUS MEDICAL SCIENCE.

In the course of its growth and development medicine has become transformed from an art to a science. Diplomas were originally granted because of proficiency in the "Art of medicine;" they are now granted because of proficiency in the "Art and Science of medicine." The future generation will, no doubt, grant diplomas for a proficiency in the "Science of medicine" alone. The art of medicine is occult: those who possess it appear to be endowed with magical, mystical, and instinctive powers by which they probe the mysteries of the human body and are able to cope with its misfortunes. The art of medicine is possessed by the savage, the sorcerer, and every charlatan that has ever offered his wares for sale to the easily duped and greatly deluded public.

The *science* of medicine has grown insidiously against great opposition. It has always been on unfriendly terms with the art of those who know no science, and at the present day the art and science of medicine, while still fettered together, are as disconnected, unequal, and unfortunate as any misalliance the world has ever known.

The art of medicine is founded upon what is called clinical experience, and clinical experience, which is essentially a matter of personal equation, is the foundation of much of the nonsense which is thought and taught and written about to-day. The great Pasteur once entertained a distinguished American visitor, who in the course of conversation remarked: "Monsieur Pasteur, your discoveries greatly interest me, but they are entirely out of accord with my clinical experience." The great savant lifting his eyes heavenward said with a fervor that only a true scientist may understand: "Dieu merci! Je ne pas *clinical experience*." On every side, at the present time, one hears scientific facts declared to be out of keeping with clinical experience.

Let us differentiate between clinical experience and clinical fact. The facts gleaned by clinical observation are truly of the greatest importance. It is by the careful observation and connotation of these facts that the symptomatology of disease has brought about the science of diagnosis; it is by a thorough knowledge of clinical facts that prognosis becomes possible; it is through clinical observa-

tion that we have been led to look for many of those morbid changes which now clearly explain the presence of the symptoms first observed, so that clinical observation is important, and clinical facts indispensable. As usually employed, however, "clinical experience" means assumptions drawn from a limited experience, conclusions based upon insufficient data, methods adopted without logical bases, and prejudices ineradicable. Clinical experience has stood out against almost every important advance of medicine. Vaccination was once derided; "It is not my clinical experience that vaccination protects against smallpox," says the antediluvian doctor; "It is not my clinical experience that bacteria can cause disease," says a man who never looked through a microscope; "It is not my clinical experience that the bite of rabid dogs causes hydrophobia," says the man in whose practice no hydrophobia has occurred; "It is not my clinical experience that there is a difference between diphtheria and simple sore throat;" "It is not my clinical experience that there may be difficulty in diagnosticating typhoid fever, and that the Widal test is a necessary adjunct." "My clinical experience teaches me that the patient must be cupped and leeched, and purged and bled," says the doctor of one hundred years ago. "It is my clinical experience that cupping and leeching and purging and bleeding are damaging and injurious to the patient," says the doctor of to-day. And so we might continue, *ad infinitum*, the repetition of opinions, weighty in proportion to the eminence of him who rendered them, showing that clinical experience can be made the basis of almost every argument that an individual chooses to advance, and to almost every method to which he lends support.

Clinical experience is only of value when it is clinical fact, and clinical facts can only be regarded as such when they are the common experience of a large number of keen observers, drawn from a very large number of carefully studied cases.

It will never be possible to eliminate from an inexact science the errors that result from personal equation, and so long as the science of medicine is without instruments and methods for accurately recording and combining every symptom and lesion presented by the patient, personal equation must play a large part in the physician's work. It can scarcely be hoped that the time will come when the diagnosis and treatment of disease will be reducible to a formula whose result can be worked out with mathematical accuracy. One by one instruments of accuracy establish themselves in medical science. The treatment of the eye being based upon

mathematical calculations, and its errors of refraction susceptible of correction by mathematical devices, we here see the nearest approach to absolute accuracy. The recording of the pulse by the sphygmograph, the recording of the temperature by the thermometer, the employment of the stethoscope, the plexor, the pleximeter, a recently devised apparatus for recording the diastolic blood-pressure, the phonendoscope, and similar devices, all point in the direction of accuracy, and while some of them have proven disappointments in failing to accomplish the ends for which they were devised, and while some of them are so expensive as to be accessible to but few cliniciaus, we find that some of them have come to stay, and that the stethoscope, clinical thermometer, microscope, hemocytometer, and hemoglobinometer, as well as a moderate chemical outfit, form essentials to the successful practice of medicine.

One only has to glance over the medical journals of the day to be nauseated by the details of clinical experiences. If only one-half of the time devoted to its writing and publication could be diverted into the direction of careful, impersonal, accurate study, how much more could be accomplished! Many men who loudly force their clinical experience upon their fellows of younger years, but greater knowledge in medical science, would better perform a few experiments in support of the views they hold. Two great illustrations, two great pieces of ignorance which the whole medical profession must recognize, are to-day in a condition of chaos, almost entirely because of the inaccuracy of clinical experience. One is the treatment of typhoid fever, the other the therapeutic use of alcohol. There are almost as many treatments for typhoid fever as there are doctors, surely as many as there are teachers. The number of specifics and abortives that have been introduced from time to time would fill many pages, should they be summarized, and yet the honest confession of every thoughtful man and every man of real, not clinical, experience is that no medical treatment which we recognize at the present time produces an important modification of the course of typhoid fever. Regarding the employment of alcohol in the treatment of disease, we have before us a remarkable paradox of clinical experience, being entirely discordant with physiological fact. Clinical experience has led the majority of practitioners to believe that alcohol is an important and useful remedy in those conditions in which the heart is depressed, while in reality all the experiments made in the laboratory show that alcohol always tends to weaken the heart, and that its employment under the conditions given cannot be recommended.

Several very important considerations should appeal forcibly and persistently to every scientific observer and practitioner of medicine. The first of these is, What is the natural course and tendency of the disease which I am to treat? The second, What is the operation of the remedy that I am about to prescribe, and what reason have I for giving it? The tendency of most diseases is toward recovery; the best hope, therefore, that the practitioner has is to hasten this recovery. His great care should be not to delay this progress by useless meddling. Let us remember that the original success of homeopathy, and the success which osteopathy is fast attaining, has for its foundation this tendency of most diseases to recover, regardless of and sometimes in spite of the physician. Or, it may be that the tendency of the disease is toward death, when of course the energy of the physician should be exerted to the utmost to prevent or delay the final moment. It takes one with more than average courage to give no medicine where none is required; almost an equal amount of courage to give only that medicine which is certainly indicated — because to do either of these things one must assume a position diametrically opposed to the majority of his colleagues, and in the event of disaster overtaking him may have to run the gauntlet of odium and disfavor alone. It is, however, the courageous man, the thoughtful man, the daring man, and above all the honest man, who is the great man, and it is the men with these attributes who, laying aside all prejudices, all conventional opinions, standing firmly in their own well founded judgments, supporting these judgments with an abundant array of facts—facts, not opinions—have made, and will make, and are making this transformation of the art into the science of medicine.

EDITORIAL COMMENT.

LABORATORY VERSUS CLINIC.

In writing the above heading we do not wish it understood that there is any antagonism between laboratory and clinical methods, but it is a thought frequently expressed in recent publications. A number of writers have decried laboratory methods in general, and specifically the failure of blood examinations to differentiate between abdominal conditions due to pus formation and those dependent upon other causes. Hence, blood examinations are said to be of little value, and better results will be obtained without them. That there is a tendency on the part of laboratory workers to overestimate the value of their findings can hardly be questioned, but that there is any real antagonism between laboratory investigations and bedside observations we cannot admit. The laboratory research of yesterday often becomes the bedside method of to-day, and thus the more exact methods of the laboratory become available for the clinician, and the general knowledge of pathology is correspondingly advanced. The advanced workers in the field of pathology realize that laboratory findings must be controlled by clinical methods, and that the distinction between laboratory and bedside investigation must be, as far as possible, eliminated. The two methods are really complemental, and the best physician is the one who can best apply them to the phenomena of disease as observed at the bedside.

Two important papers have recently appeared dealing with this general topic. Sir Dyce Duckworth (*Berliner Klinische Wochenschrift*, April 21, 1902) says that the tendency of modern medicine is too much in the direction of the *quidquid irritans* and too little in that of the *quidquid irritabile*. The discovery of the bacillus of tuberculosis has led physicians to regard the parasite as of greater importance in respect to the whole subject than of the host into which it intrudes. Direct exception is taken to the dictum of Osler, that scrofula "is tuberculosis, and Koch's bacillus is the essential element in it." Duckworth contends that a person may be scrofulous for life, and yet never become tuberculous. Any conception of infection that does not reckon with the host is, from a clinical standpoint, a very narrow view to take of the question. This is exactly the standpoint of the laboratory worker.

In reference to blood examinations, C. Y. White (*University of Pennsylvania Medical Bulletin*, April, 1902) says that no disease can

be diagnosticated absolutely by examination of the formed elements of the blood. The most typical blood picture is that of splenomyelogenous leukemia with a leucocyte count. In lymphatic leukemia the diagnosis cannot be made absolutely by the blood, cases of sarcoma having presented similar blood pictures. The lymphocytosis found in pertussis and in anemia is difficult to distinguish from leukemia with low leucocyte counts. Again, in both forms of leukemia, intercurrent disease may alter the type of the leucocytosis. In conclusion he says: "Certain typical conditions almost invariably produce changes in the blood. These changes may be of positive or of negative value in the diagnosis of the disease. In some conditions the blood changes may absolutely clinch the evidences pointing to the diagnosis; in other cases, with our present knowledge, the blood offers nothing as an aid in the diagnosis. This can be said of any branch of medical or surgical methods of which blood examinations are only a part. In any case blood analysis to be of value must be considered only in connection with the findings of other methods of examination, the history of the illness, and the presence of complications."

THE SMALLPOX EPIDEMIC.

The remarkable recrudescence of smallpox was predicted in the pages of MEDICINE more than two years ago. At that time we called attention to the numerous foci of infection in the United States, and predicted that unless vaccination was extensively adopted there would be a severe epidemic, which would increase from year to year until it assumed alarming proportions. The prognostications have been amply borne out by the extensive epidemic of last winter. A marked increase will be noted next year, as these cases are disseminated throughout the community and form points from which the infection spreads in every direction. The long immunity of the people of the United States from any extensive smallpox epidemic has created a confidence and a neglect of vaccination which will lead to the most deplorable results.

When we inquire into the causes of the epidemic in this country, we find that it is attributed, and in part traceable, to returning soldiers from Cuba and the Philippines. In our newly acquired island possessions smallpox is constantly present. It seems to be a mild smallpox — that is, the mortality, instead of being in the neighborhood of 25 per cent, is estimated as low as one, or one-half of one per cent, figures which are very surprising in the experience of those who have been through former epidemics. This has led to

a doubt in the minds of many as to whether the present epidemic is a true smallpox, and it has been variously labeled "Cuban itch," "black measles," etc. The consensus of opinion at the present time is that the disease is true smallpox. It cannot be argued that a low mortality means a different disease. Clinically these cases all resemble smallpox, excepting in the mortality rate. This argues one of two things: either that there is a greater resistance on the part of the host, or the germ is lessened in its virulence. The former is probably not the case, as epidemics of smallpox, until the last few years, had presented about their usual mortality, but the infection which has been imported into the country is certainly devoid of that degree of virulence which the smallpox infection commonly has. The very mildness of the cases has added difficulty in dealing with the epidemic. Communities have been loath to take those stringent measures of quarantine and enforced vaccination which are so important in dealing with a smallpox epidemic. Those who have had opportunities for studying the present epidemic are surprised at the number of very mild cases, those in which the constitutional reaction is slight, the patient being scarcely sick enough to require medical attention, or be in bed. It is these mild cases that form the greatest difficulty in properly quarantining the disease.

Unless there is an awakening of the community, and a realization of the importance of vaccination, the epidemic is bound to spread. It is by no means certain that the present low mortality will be maintained. If it is assumed that the germ in the present epidemic is of lessened virulence, it is by no means certain that such a condition will continue. If a germ has been imported from the Philippines which under a tropical habitat has acquired a lessened virulence, it is more than probable that under altered conditions it will again become deadly. Hence to the probable increase in the number of cases in the next few years must be added probable increase in the mortality.

THE MILK SUPPLY IN RELATION TO THE PUBLIC HEALTH.

No more profound disturbance in sanitary circles has been occasioned than that furnished by Koch in his announcement to the International Congress of Tuberculosis of the non-identity of bovine and human tuberculosis. His remarks were at first received with incredulity, but some pathologists regard his statements as substantially correct. In large measure the sterilization of milk, which has

been recommended of late years, has been based upon the theory of the possibility of the direct infection of children with tuberculosis. While it cannot be denied that direct infection of the alimentary tract by tuberculous milk may and does take place, it is clear that such infection is rare, and that the number of cases of human tuberculosis derived from cattle are extremely few. It was inevitable that a rude shock of this kind should cause a painful awakening, but there is no gainsaying the fact that the sterilization of milk does not prevent tuberculosis, but that the value of this procedure has not been fully appreciated because of the faulty explanation upon which it is based.

A recent valuable study by J. H. M. Knox and V. H. Bassett (*Maryland Medical Journal*, June, 1902) contains an exceedingly suggestive study on the relation of child mortality and defective milk supply, as exemplified in the statistics of Baltimore. The study includes the year 1901, and shows that as the weather becomes warmer in the spring months there is an increase of deaths from diarrheal diseases. There is a slight increase in May, which is still more marked in June, the highest death-rate being reached in July, when there is a slow decline, August presenting a smaller number, September about equaling June, and then there is a falling off until December.

A table is given showing the number of germs in a cubic centimeter of milk supplied to the children of the poor in Baltimore. In the milk supplies of poor quality during the summer months there was found a bacterial content of over two million, while in the milk supplies of better quality there was but 500,000. In the Baltimore street sewage there was 750,000 germs to the cubic centimeter. The comparison shows that the milk of poor quality is a far better culture medium than is ordinary sewage. A table is given in which the germ content is shown to bear a direct relation to the temperature. The curve of increase in the bacterial content in the milk corresponds precisely with the infant mortality rate from diarrheal diseases.

The lesson taught by this study is the importance of the milk supply in the development of diarrheal diseases in children, a fact that has been wonderfully brought out in the experience of New York after the establishment of the pure milk supply by Straus. Unquestionably a considerable improvement can be effected in a germ-laden milk by cooking, as a large proportion of the putrefactive bacteria may be destroyed by this means, but how far such milk will be made available for nutrition is a question.

The question of the milk supply is one of the greatest importance from the standpoint of practical sanitation, and even if we abandon the view held by many that raw milk is a frequent source of tuberculosis, there still remains the nutritional disturbance and diarrheal affections, the common causes of an excessive infant mortality.

THE INCREASE IN CANCER.

The mortality tables of all civilized countries which are kept with sufficient accuracy to admit of careful deductions show marked increase in the death-rate of cancer. The English statistics show that during the last four years the deaths from cancer have numbered 672 per million living for men, and 975 for women. Thirty years ago the rates were 242 and 510 respectively. This shows a gradual relative increase among men, and, on the whole, a very marked increase in the total number of deaths from malignant disease. In the English statistics cancer is made to include all malignant neoplasms. The question as to whether this represents a true increase in the disease, or if it is merely due to increased accuracy in diagnosis, which means that deaths that are now assigned to malignant disease were formerly included under other disorders, cannot be definitely ascertained. The best statistics that we have bearing upon this subject are the large continental hospitals, in which every case that dies is subjected to a post-mortem examination. The figures show that the English statistics give about the same number of deaths from malignant disease that a large series of post-mortem examinations furnish. This shows that a considerable proportion of the increase in cancer which is now noted in the mortality statistics must be credited to the increased accuracy in diagnosis. It does not, however, account for all the increase, as there must be a considerable number of cases which are due to malignant disease which would be recognized if a thorough post-mortem examination were made in every case.

In part, the increase is to be attributed to increased longevity. Cancer, while not confined to any particular decade, increases in relative frequency after middle life. The average age of persons now alive is considerably greater than it was thirty years ago. This has been due to the lessening of early life mortality and to the marked decrease in deaths from the infectious diseases. An increased longevity means that a larger proportion of the community have reached the cancer age; consequently, we can look for a

greater increase in the diseases which are common past middle life and those degenerative conditions that are associated with senility.

It is manifest that this topic is of considerable importance. If cancer is assuming epidemic proportions, in our present inability to combat the disease and our very limited knowledge of its nature it is manifestly fraught with great importance from the public health standpoint. If, however, factors which we know account in large measure for the increase, then there is no reason why there should be any special alarm.

BOER MEDICINE.

According to Dr. Kendal Frank the Boers are still in the folk-lore phase of medicine, and to this the large mortality of reconcentration camps is due. A nephew of President Kruger asked Dr. Beauman of the hospital to give his wife a cow-dung bath as a cure for rheumatism. The Boers seem to have as great a respect for cow manure as the Hindoo cow-worshipers, and to this many diseases are chargeable. A cat was seen running away with its fur clipped off. The fur had been roasted and then applied as a remedy for bronchitis to the chest of a child. Dr. Pern, being sent to see a child who was ill, found that the parents had killed a goat and removed all the viscera. They then put the child in the goat, allowing its head to protrude through an opening made in the sternum. A favorite remedy for jaundice is to rub the body with cabbage seed. The seeds are then sown. When they come up the jaundice disappears. According to Boer folk-lore the tooth of a horse worn around the neck on a string will cure rheumatism. A piece of potato put into each ear and a necklace made of square pieces of the same will cure earache. Toothache is cured by cutting finger- and toe-nails off short; the parings are put with a lock of hair and some water into a bottle, which is then corked and buried, and the toothache disappears. A black fowl opened and applied hot and bleeding to the chest is a cure for pneumonia.

These folk-lore remedies are found in all rural populations, and their chief danger lies in the neglect of hygienic precautions which they entail. If they exist to the extent that is claimed among the Boers, which is far from unlikely, the high mortality among children in the reconcentration camps is explicable without charging it to British neglect. The Boers had lost the cleanliness of the Hollander ere the war, and it is by no means probable that they have regained it since.

PROPHYLACTIC INJECTIONS OF ANTITOXIN.

It is now a generally accepted view that the earlier antitoxin is administered, the more efficient the remedy. Numerous articles have appeared of late advocating the preventive administration of the serum. These views should receive wider dissemination and a more general acceptance than has heretofore obtained. In the minds of many practitioners there is an unfounded prejudice against the use of the serum. In some way they have associated it in their minds with the tuberculin or other products that are directly derived from bacteria, and hence are regarded as poisonous. The antitoxin serum is devoid of danger unless it is accidentally contaminated, or its administration is carelessly undertaken. The administration of the serum simply increases whatever of natural immunity there may be in the individual, or if he have none at all, creates an artificial immunity. Wherever there is a suspicion of exposure to diphtheria the serum should be employed, and in this way the family epidemics which have been so disastrous in the past ought never to be repeated.

An important step has been taken in the New York Department of Health in the warfare against diphtheria. A special corps of inspectors has been organized for the free administration of antitoxin. It is the intention of the Health Department, in crowded tenement houses where isolation cannot be secured, to immunize all in the house. Physicians are urged to report all cases in which diphtheria patients are not properly isolated, and the Health Department through its inspectors will immunize those who have been exposed. In addition the dispensaries in the crowded quarters of the city are to be supplied with sufficient antitoxin to inject all suspected cases before leaving the dispensary. This procedure does no harm, and in true cases of diphtheria secures antitoxin treatment from twenty-four to thirty-six hours earlier than has been the case in the past.

ABSTRACTS.

MEDICINE.

The Evolutionary Aspect of Infectious Diseases, with Especial Reference to the Local Venereal Diseases.—LYDSTON, G. FRANK. *Journal of the American Medical Association*, vol. xxxviii, Nos. 20 and 21, pp. 1291 and 1366, May 17 and 24, 1902.

For many years past Lydston has contributed articles under this or similar captions in which he expounded somewhat novel views of infectious diseases—views antagonistic in many respects to those held by the majority of late germ pathologists. The burden of his contention is that, inasmuch as the intimate relation of germ infection to pathology has been established, we must find common ground upon which to study both the germ and the field of its operations. He contends that infectious microörganisms should have been investigated from the first along strictly biologic and evolutionary lines, inasmuch as evolutionary principles, although defective in some immaterial points, involve biologic laws controlling both the animal and vegetable world. It is not in harmony with logical and fair scientific investigation to apply the law of evolution to the host and not to the parasite. If adaptation to environment and differentiation of type, with consequent modification of physiovital properties, occur in the animal host, the same must occur in unicellular organisms, which in this instance implies the parasites of disease. The germ is confronted with the absolute necessity of adaptation, to resist which is death to the species. Granting that variations of environment must necessarily influence the germ, the author believes it to be impossible that the germ can be always and invariably the same. Just as the higher types of animal and vegetable life represent approximately the culmination of evolutionary influences in the life-history of a given species, so the bacterium of disease, as we observe it to-day, is the focal point of many converging influences which have necessitated a marked change from the original type.

While the theory of spontaneous generation is insusceptible of proof, the evidence against it is not complete. Granting the evolutionary law to be true and operative in host and parasite alike, we must necessarily, in tracing any given organic species to its ultimate, come face to face with the only possible explanation of its beginning, namely, spontaneous generation—granting, of course, that

the Mosaic cosmogony is not accepted. Notwithstanding his belief in the possibility of spontaneous generation, he asserts that it has nothing whatever to do with his present contention, which is (1) the spontaneous evolution of new and virulent properties in germs primarily innocuous; (2) the changeability of pathogenic microorganisms under certain circumstances of environment, which changeability is a mere feat of adaptation resulting in increased virulency on the one hand, and attenuation on the other, transformations precisely similar to those which are developed experimentally in the bacteriologic laboratory. The feats accomplished in the culture and modification of germs in the laboratory are proof of the existence of a biologic law of evolution, which is the basis of all bacterial development, transformation, and activity. "How can it be possible," he asks, "for us to accomplish in the laboratory variations in pathogenic microörganisms save through the operations of a law which is many times more potent in the life-history of the germ in its normal habitat than in the feeble hands of the laboratory experimenter?"

Lydston calls special attention to the influence of physical factors of environment, and the necessity of special conditions in the development of pathogenic properties in microörganisms. The ultra-specific theories of disease which have been dominant until recently are no longer tenable. He alludes especially to Cohn's classification of germs into pathogenic, zymogenic, and chromogenic, and shows that the cholera bacillus, one of the most specific of pathogenic microörganisms, is convertible in the laboratory, first, into a non-pathogenic, chromogenic microörganism; secondly, into a zymogenic microörganism, and that it is readily transformed in the opposite direction until it arrives at the starting-point, the typical comma bacillus of Asiatic cholera. This cycle proves a law, and disproves the prevalent theories of the specificity of disease.

Human and Bovine Tuberculosis.—ADAMI, J. G. *Medical Chronicle*, Fourth Series, vol. ii, No. 6, p. 401, March, 1902.

In this article Adami has set forth all of the arguments for and against direct infection of human beings from cattle, and in a summary draws the following conclusions:

Bovine tuberculosis is easily conveyed from cattle to cattle, and, whether by inhalation (the most common method), by the milk (in calves), by contamination of troughs and drinking-water through the saliva and nasal discharge, through the genito-urinary passages, or by intra-uterine infection (very rare), this transmission from

one animal to another is far and away the most common mode of infection in cattle—so common that for practical purposes all other modes may be neglected.

Human tuberculosis is transmissible to cattle. Pure cultures of the bacilli rarely cause infection; mixtures of tubercle bacilli with other microörganisms, as in sputum, appear to be more infectious. The difficulty in inducing artificial tuberculosis favors the idea that natural infection of cattle with human tuberculosis must be of rare occurrence.

Certain breeds of swine seem to be easily affected with both human and bovine tuberculosis, and when infected with the former the germ gains an increased virulence for guinea-pigs and rabbits. Pigs are frequently infected by milk from tuberculous cows. It may be that swine and other domestic animals act as intermediaries in the passage of tuberculosis from human beings to cattle. The conditions favoring such transmission from man to hog, or from hog to cattle, so rarely show themselves that for practical purposes this mode of infection may be neglected.

It should be possible to eradicate bovine tuberculosis in a region in which human tuberculosis continues to be wide-spread.

Human tuberculosis in the majority of cases is conveyed from man to man by inhalation. More rarely it gains access through the alimentary canal, and still less frequently through the genito-urinary tract, through surface wounds, and from mother to infant during intra-uterine life.

In the main, bacilli causing infection in man are derived from previous cases of the disease in human beings.

In the passage through the human being the tubercle bacilli have acquired properties different from those that have passed through cattle; they differ in shape, rate of growth, the appearance of the growth outside of the body is different, and their virulence to the usual test animals is different. These differences are not sufficiently marked nor constant to permit us to say that we are dealing with a distinct species. On the contrary, the evidence points clearly to the fact that in the different species of animals we encounter at most races of the tubercle bacillus.

Bovine tuberculosis can be transmitted to man, either through wounds or the digestive tract.

By passing through cattle the tubercle bacillus gains increased virulence for cattle, rabbits, and guinea-pigs, but lessened virulence for man.

Save in the very rare cases of wound infection, there is signifi-

cant evidence that bovine tubercle bacilli do not infect adult human beings.

In early life there is an especial liability to infection by the tubercle bacillus of bovine origin.

A few positive records of direct infection of tuberculosis from cattle to man through the agency of milk indicate that the cattle from which such milk is derived must be extensively diseased, and more especially those suffering from disease of the udder.

The practical deduction from the foregoing is that animals so extensively diseased should be destroyed, but no great danger is to be apprehended of the transmission of tuberculosis from cattle to man by milk. The great cause of infantile mortality is the use of badly kept or fermenting milk, and consequent inflammation of the gastrointestinal tract. Had the agitation in England for municipal and governmental supervision of the milk supply been based upon what we know concerning contaminated milk in general, and its dangers, rather than upon supposed tuberculous infection from this source, it is safe to say that Koch's address would not have had the deleterious effect claimed for it.

The Bacteriological Examination of the Rose Spots in Typhoid Fever.—SEEMANN, C. *Wiener Klinische Wochenschrift*, 15th year, No. 22, p. 580, May 29, 1902.

It is with difficulty that the typhoid bacillus is recovered from the intestinal discharges, and it is especially difficult to distinguish the typhoid bacillus from other bacteria, especially the bacterium coli commune. The typhoid bacillus is not constantly present in the urine and sputum. The detection of the typhoid bacillus in the circulating blood is difficult, and there are negative results from a large proportion of the examinations. Neuhauss in 1886 advanced the hypothesis that the typhoid bacillus was found in the rose spots in this disease, and reported nine cases out of fifteen in which the bacillus was identified in the rose spots. A number of observers have followed the methods and reported negative results. Of late the question has been restudied, and Neufeld reports the recognition of the typhoid bacillus in thirteen out of fourteen cases.

The writer reports upon thirty-six cases of typhoid fever, of which thirty-four were examined. In the remaining two cases the roseola was absent. In the thirty-six cases, in all, ninety-eight incisions were made, mostly three incisions in each case. In cases in which the first examination was negative, other spots were incised. It is believed that the older spots contain typhoid bacilli

that are greatly weakened, and hence may not grow upon artificial media.

The method employed was to clean the skin with ether and alcohol, and then with a sharp-pointed scalpel which had been sterilized in flame a drop of bouillon was placed upon the rose spot. Slight scratches were then made over the surface, after the manner in which a vaccination is made, so as to obtain a maximum quantity of serum and a small quantity of blood. With the same scalpel the solid media or bouillon was inoculated. These were then placed in a brood oven for a period of fifteen or twenty hours, after which the tubes of bouillon were found to be cloudy, or else presented no changes.

The hanging-drop method was then employed to study the bouillon cultures. There were usually three appearances: (1) Plump, motile bacilli which were later identified as typhoid bacilli; (2) small or large round cocci; and (3) occasionally a sarcina-like appearance probably derived from the skin or the air. In the identification five tests were used: (1) Decolorization by Gram's method; (2) the simultaneous clouding of both tubes in acid glucose bouillon and without development of gas; (3) a failure to coagulate milk in four or five days in the brood oven; (4) absence of the nitroso-indol reaction; (5) the power of agglutination with typhoid serum diluted 1 to 40.

Septic Polyarthritis.—WRIGHT, G. A. *Lancet*, vol. clxii, No. 20 of vol. i, p. 1376, May 13, 1902.

Pneumococcus Arthritis.—COLE, R. I. *American Medicine*, vol. iii, No. 22, p. 905, May 31, 1902.

Wright reports three cases to which the term septic polyarthritis is given. The most typical of these was that of a woman 35 years of age who was admitted to hospital October 3, 1901. Her health had been good until a confinement in July, 1895. Seven weeks after delivery the small joints of the hands and wrists became swollen, and four months from the time of delivery the toes were involved. After the labor in question she had a continuous purulent vaginal discharge, and in 1896 was in hospital for uterine trouble. In June, 1897, the joints involved were fixed, and at this time there was an extension of the trouble to the knees and cervical spine. The hips and shoulders were involved in 1897. In 1899 the hot-air treatment was employed, which was followed by some improvement, the mobility of the jaw, neck, and hands being partly regained. There was no marked synovial effu-

sion, but marked thickening of the joint structures. There was distinct grating on rotation of the shoulder-joint.

This and the other two cases showed an affection which attacks many joints, though it may begin in one and last a long time, and it may lead to complete crippling. There is no suppuration, and there is repeated subsidence with recurrence. There is no nodular, bony, or cartilaginous outgrowth or hydrarthrosis. The explanation offered for these changes is the absorption of one or other of the ordinary septic organisms. In the treatment of the condition an effort should be made to get rid of the septic focus. The hot-air treatment in the case described was probably of value, but a more important element in the improvement was the elimination of the vaginal discharge.

Cole reports two cases of pneumococcus arthritis, which brings the total number so far reported up to forty-one cases. The first case was that of a man 50 years of age admitted to the Johns Hopkins Hospital in a semicomatose condition. The symptoms at first were indefinite, but later there was a frank pneumonic involvement of both lungs. During the progress of the illness the ankle became red and swollen, and ten days later it was punctured and a syringeful of purulent fluid removed, which contained many diplococci; cultures made from this fluid showed the pneumococcus. After the arthrotomy there was a marked improvement in the patient's condition.

The second patient was a colored man 55 years of age, who for some years before admission had trouble with his joints. He complained of intense pain in the knees and ankles. Examination of the chest showed slight impairment in the percussion note of the left infraclavicular space. The patient was apathetic. An examination of the blood showed the red corpuscles reduced, leucocytes 10,000, and hemoglobin 50 per cent. Lumbar puncture gave a pale yellow fluid containing leucocytes in which were many diplococci. Aspirated fluid from the joint contained the same character of leucocytes, and eight cubic centimeters of blood was withdrawn for the purpose of making cultures. The growth showed the diplococcus pneumoniæ, the diagnosis being a pneumococcus septicemia, meningitis, and arthritis.

The clinical history in this case showed a primary joint infection, probably determined by the old arthritis. At the post-mortem examination the point of entry of the organism could not be determined, no local infections were discovered, the bronchopneumonia was thought to be secondary to the arthritis, and the infection occurring only as a terminal event.

The Unilateral Occurrence of Kernig's Sign as a Symptom of Focal Brain Disease.—Sailer, Jos. *American Journal of the Medical Sciences*, vol. cxxiii, No. 5, p. 772, May, 1902.

Two cases are reported in which Kernig's sign was present upon one side. One other case in which this sign was present upon one side of the body has been reported by Herrick, who noted it in the infected leg of a man suffering with gonorrheal gonitis. In both of Sailer's cases there was spasticity upon the affected side, but there was no retraction of the hamstring muscles. There were all the characteristic phenomena of Kernig's sign. As a result of the observation in these cases he comes to the conclusion that Kernig's sign may occur as a sign of focal encephalitis, and thus may be present only upon one side of the body. Sometimes it is associated with spastic paresis of the leg upon that side. In these cases there may be a persistent tonic spasm of the flexor muscles of the arm, but this does not resemble Kernig's sign in its mechanism. The most reasonable explanation of Kernig's sign is to ascribe it to an irritative lesion of the pyramidal tract that diminishes but does not destroy its functional activity.

W. G. Shields (*ibid.*) reports an examination of one hundred cases, all non-meningitic, for Kernig's sign. In five cases it was present; three showed the sign unilaterally and two bilaterally. Of the latter, one was uremic and the other a case of typhoid fever. In both of these cases the sign disappeared after recovery.

F. S. Clark (*ibid.*) reports three cases of meningitis in which Kernig's sign was persistently absent, though it was repeatedly looked for during the course of the disease. The cases confirm the opinion that Kernig's sign is particularly unreliable in tuberculous meningitis.

A Case of Malarial Neuritis.—Luzzatto, A. M. *Berliner Klinische Wochenschrift*, 39th year, No. 17, p. 375, April 28, 1902.

Numerous cases of malarial neuritis have been reported, but in some of them there was doubt as to the malarial nature of the trouble, one of which was that of a 34-year-old laborer, in whom there was no evidence of syphilis or lead intoxication. He came from a markedly malarious district in Italy. Quinine was administered. Some three months after the beginning of the disease the patient was taken with severe pain in the extremities and back. There was tenderness along the nerve trunks and marked weakness of the muscles. Some six weeks after this attack, when there had been some improvement in the muscular power, the patient was

again suddenly seized with pain in the extremities. He was placed in bed, and very soon there was complete paralysis of the arms and legs. Repeated examinations of the blood for the malarial parasite were negative. In March, some six months after the development of the malarial condition, the patient died from a croupous pneumonia.

The autopsy showed no microscopic changes in the nervous system. The lungs presented the ordinary appearance of pneumonia, the liver presented some fatty degeneration, the kidneys were enlarged, there was slight chronic interstitial and acute parenchymatous nephritis. The microscopical examination of the peripheral nerves showed them to be very much altered. The myelin sheath was found to be broken with frequent swellings. The axis cylinders were altered, varicose, and in places broken into irregular masses. The microscopic appearances of the muscle fibers were apparently normal with the exception of those of the thumb and little finger. The anterior horns of the spinal cord in both the lumbar and cervical enlargements were pigmented, the nuclei were excentric, and there was slight shrinking.

Ascites Associated with Solid Abdominal Tumors. — OSLER, WILLIAM. *Philadelphia Medical Journal*, vol. ix, No. 21, p. 928, May 24, 1902.

Attention is called to the occasional association of ascites with solid tumors of the abdomen, particularly those of the ovary. In the gynecological clinic of the Johns Hopkins Hospital, out of 9400 cases, there were ten with solid ovarian tumors. In six of these ascites was present, and three of them had required repeated tapping. All of the cases recovered after operation. Eden calls attention to the fact that ascites is the rule with solid tumors of the ovary, and is so exceptional in fibroids of the uterus that its presence almost serves to exclude them. Ascites may occur in leukemia, the distention being sufficient to obscure the enlargement of the spleen. In a case of solid tumor of the mesentery, there was ascites of moderate degree.

Justus Test for Syphilis.—TUCKER, H., and HUGER, W. E., JR. *Philadelphia Medical Journal*, vol. ix, No. 19, pp. 846–849, May 10, 1902.

The Justus test for syphilis is based upon the theory that in lues there is an impairment of the vitality of the blood-corpuscles. The administration of mercury causes these devitalized blood-corpuscles to be destroyed, and their hemoglobin is eliminated. This causes a reduction in the percentage of hemoglobin, which is observed within

twenty-four hours after the administration of a mercurial inunction. It was claimed by Justus that in other diseases this fall in hemoglobin does not take place after the administration of mercury; hence the conclusion that if an abrupt fall takes place, it is proved that the individual has been syphilized.

Tucker has examined twenty-seven cases of syphilis, most of them suffering with a primary venereal sore. The test was found to be positive in 38 per cent presenting true chancres, while in chancroids 57 per cent were found to give a positive reaction. In three cases of ulcerative herpes it gave a positive reaction. These observations show that the Justus test has no practical value in the differential diagnosis of venereal ulcers, as the reaction occurs with an almost equal degree of frequency in the non-syphilitic conditions with which syphilis may be occasionally confused. Huger reports sixteen cases which also show that the test is unreliable, as positive results were obtained in chancroids and negative in cases that were unquestionably syphilitic.

SURGERY.

Why Not Treat the Gall-bladder as We Do Appendicitis? — PARK, ROSWELL. *Canadian Practitioner and Review*, vol. xxvii, No. 6, p. 310, June, 1902.

The writer calls attention to the similarity between the appendix and the gall-bladder. Both are hollow, more or less tubular in shape, lined with mucous membrane continuous with that of the intestine. The appendix can hardly be dignified with the name reservoir. So long as both of these cavities can empty themselves, they cause no trouble. When occlusion occurs, then we have inflammation.

A severe toxemia may result from the retention of morbid products in the gall-bladder, and the same may be caused by the retention in the appendix. The extrinsic lesions as well as the formation of concretions are common to both structures. Each is subject to localized pain and tenderness. The diseased appendix causes a disturbance of the colon, while a diseased gall-bladder involves the functions of the stomach and the pancreas. The analogy between the gall-bladder and the diseased appendix should lead us to treat the former as we do the latter, namely, remove it. This removal of the gall-bladder is said to be preferable to the late method of opening and drainage, which too frequently leaves permanent sinuses. It is a fair supposition that when the duct of the gall-bladder is

occluded, and the gall-bladder contains calculi and its walls are diseased, it has ceased to functionate as a normal gall-bladder. When it is removed, that is the end of calculus formation and other disturbances of function.

Shot Wounds of the Heart. — BERARD, L., and VIANNAY, CH. *La Presse Médicale*, No. 46, p. 543, June 7, 1902.

Wounds of the heart have long been considered as immediately fatal. This opinion has not been based upon an analysis of the reported cases, which prove that a certain number of perforating wounds of the heart are followed by death more or less remotely. Of 329 cases of heart wounds, 94 were followed by immediate or rapid death, and 235 survived a considerable length of time, some of them recovering. Most cases of surgical intervention in wounds of the heart have followed stabs in which suture was employed to prevent hemorrhage. The number of gunshot wounds of the heart amenable to surgical intervention have been very few.

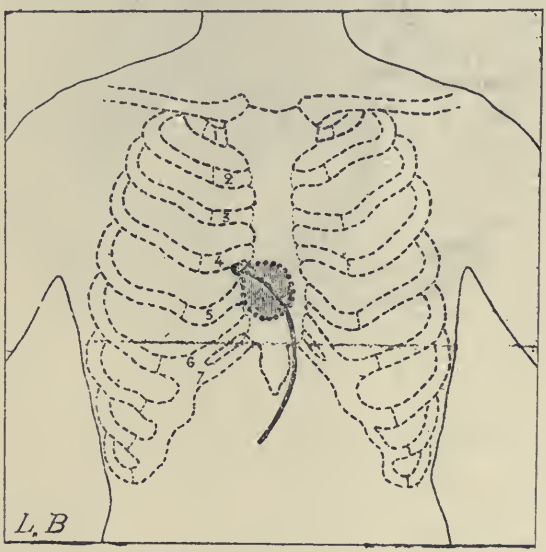


FIG. 1.—Line of incision and wound of entrance. The circle represents the application of the trephine.

A case of gunshot wound of the chest occurred in a man 28 years of age. The bullet entered in the fourth intercostal space, just to the right of the sternum (Fig. 1). The wound of entrance was circular, the edges being powder-stained. Consciousness was lost, the extremities cold, face livid, respiration was rapid and superficial, and the pulse absent. There was no modification of the precordial dul-

ness, and no fluid in the pleural cavity. Stimulants were given; the pulse returned and the respiration improved. The absence of signs of hemorrhage in the pericardium led to the deferring of surgical intervention. Unfavorable symptoms appearing, the sternum was trephined, a portion being removed the size of a silver dollar. This revealed the anterior portion of the pericardium, which appeared to be ecchymotic, but was not followed by hemorrhage. A probe was then introduced, which traversed the cavity of the pericardium, but it was impossible to learn if the left pleural cavity was opened. The absence of hemorrhage led to the belief that possibly the bullet had opened below the diaphragm. The articulations of the sixth

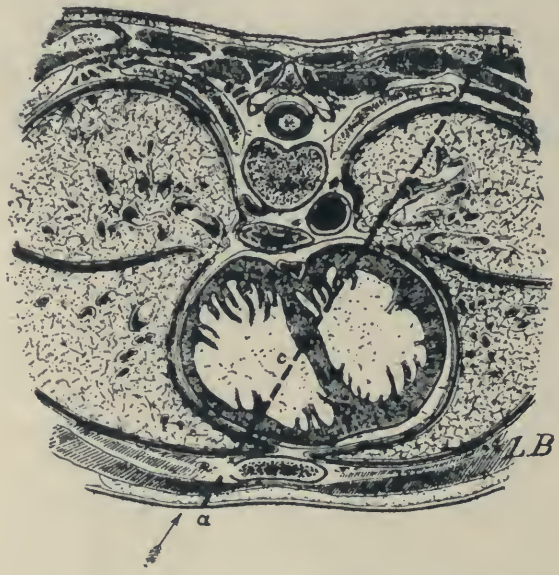


FIG. 2.—The course of the bullet through the chest: *a*, wound of entrance; *b*, left lung; *c*, heart; *b*, bullet embedded in the muscles of the back.

and seventh ribs on the right side were opened, including the insertion of the diaphragm, which opened into the epigastric region. Nothing being discovered, the exploration was terminated at the end of twenty-five minutes, it not seeming to have altered materially the condition of the patient. The second day after the injury the respirations were 29, the pulse 128, and the temperature had somewhat increased. On the third day the temperature still further increased, and the patient died.

The autopsy showed that the bullet had penetrated the anterior wall of the pericardium (Fig. 2), which cavity contained a small

quantity, not exceeding a drachm, of coagulated blood. The bullet had traversed the heart from before backwards, perforating both ventricles (Fig. 3), passing through the lower part of the left lung and embedding itself in the abdominal wall.

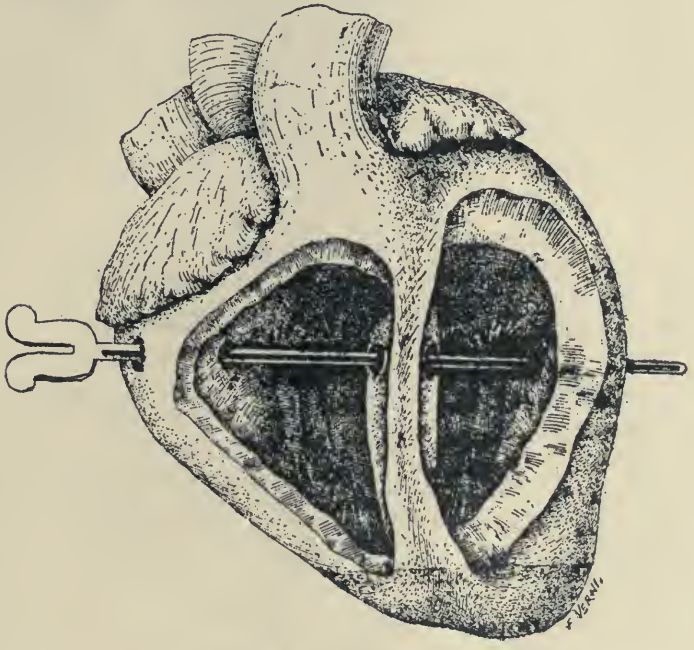


FIG. 3.—Track of the bullet through right and left ventricles and the interventricular septum.

The case is notable from the fact that the classical signs of perforation of the heart were absent, notwithstanding that both ventricles were opened.

Is Chloroform More Dangerous than Ether?—CROUCH, H. C., and CORNER, E. M. *Lancet*, vol. clxii, No. 21 of vol. i, p. 1457, May 24, 1902.

The writers have studied the influence of ether in the development of pneumonia and other respiratory complications in the St. Thomas Hospital during the past twelve months. They include in the term threatened inflammation the respiratory complications which arise within the first twenty-four hours after the anesthesia. From this list was excluded all cases in which the temperature may have been influenced by suppuration. The writers have studied their material with thoroughness, and were quite unprepared to find that the death-rate, if made to include those who died after its

administration, was higher than that of chloroform. They say that if their figures are correct, anesthetists are in error in preaching the greater safety of ether as compared with chloroform. It is merely changing the venue of the death from the operating table for the bed, the house-surgeon's signature for the coroner's. The chief cause of respiratory complications following operations is ether, where this anesthetic is employed; the secondary contributing causes are the length of time of the operation, the previous administration of gas, the inexperience of the anesthetist, and the exposure of the patient during and after operation. They recommend chloroform for long operations on the trunk.

The Relation of the Caliber of the Urethra to Vesical Tone.—LYDSTON, G. F. *American Medicine*, vol. iii, No. 25, p. 1068, June 21, 1902.

In his early experience the writer was accustomed to regard internal urethrotomy, and especially meatotomy, as not only safe, but devoid of untoward results.

There is a normal vesical tonus varying with age which is regulated and controlled by the caliber of the urethra, and more especially of its outlet. Anything that diminishes the elasticity of the urethral walls without at the same time materially diminishing its caliber, or anything that increases the urethral caliber but fails to decrease its elasticity, necessarily lessens the resistance. Obstruction in the old usually produces vesical atony; in the young, vesical hypertrophy results.

The urinary meatus is the most important portion of the urethra in maintaining pressure equilibrium. It is the narrowest part of the canal and opposes a greater resistance to the urine during micturition than any other portion. When the meatus is nearly or quite as large as the remainder of the canal, the urine flows away more rapidly. The elasticity and caliber of the rest of the canal neutralizes the effect of the meatotomy in great degree, effecting an improvement, but later a relative atony of the bladder results. The practical deduction is that a meatotomy and free urethrotomy should be avoided when possible.

Linen Sewing-machine Thread for Ligatures and Sutures.—BARKER, A. E. J. *Lancet*, vol. clxii, No. 21 of vol. i, p. 1465, May 24, 1902.

Attention is called to a material which because of its commonness appears to have been little used either as a ligature or suture material, but which the writer finds possesses many merits. The linen thread made for the sewing machine is readily procurable and

is relatively cheap. It can be easily sterilized by boiling in plain water and then stored in methylene spirit. It has great tensile strength, is readily tied, and the knot does not slip. It is easy to work and runs through the eye of any suitable needle, having been spun with special care to run evenly through the sewing-machine needle. Three sizes are recommended: No. 40, which is sufficiently thick for use in the abdominal wall or for tying the larger sutures; No. 60, which is finer, but still very strong; and No. 90, which is fine enough for suturing the intestines.

THERAPEUTICS.

Toxic Dosage in the Treatment of Some Nervous Disorders.—KRAUSS, W. C. *New York Medical Journal*, vol. lxxv, No. 19, p. 798, May 10, 1902.

The lack of results in the administration of drugs has led to a sort of skepticism as to the value of therapy in this department of medicine. Especially is this rapid or cumulative dosing to be enjoined in cerebral syphilis. We must recognize that there is no maximum dose, but each patient should be treated individually, his vulnerability recognized, and that alone should be the index for the administration of the remedy. The drugs to which particular reference is made are mercury, arsenic, nux vomica, hyoscine, atropine, and nitroglycerin.

The dose of bichloride of mercury is commonly stated from one-twentieth to one-tenth of a grain. Such quantities have very little effect in cerebral syphilis. If we would obtain prompt results the quantity must be carried up to one or two grains daily, or until marked toxic effects are produced. Under such treatment gummata rapidly disappear. The dose of Fowler's solution is commonly given from two to ten minims. The specific medication with this drug often requires it to be carried to fifteen or twenty drops, or even more. Nux vomica is a valuable drug in the treatment of neurasthenia and allied conditions. In many cases where little effect is obtained from the traditional ten drops, if the dose is increased to thirty or more favorable effects will be noted. Nitroglycerin is invaluable in the treatment of neuralgia and neuritis. With this drug, begin with one-hundredth of a grain, gradually increasing if the pain does not subside until the patient is receiving from thirty to fifty tablets daily or until the pain ceases. Tolerance of the drug is quickly established, and it is important to produce

the physiological effects. Atropine and hyoscine are of value in the spasmodic disorders, such as the tics, torticollis, etc. In some cases of chronic torticollis it is necessary to administer alternately atropine one-hundredth and hyoscine bromide two-hundredths of a grain, continued for weeks and even months. Some of these spasmodic diseases are incurable, not even yielding to surgical interference, but before being declared hopeless they should be submitted to heroic medication.

Suprarenal Extract in Hay-fever.—CLARK, J. P. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 25, p. 664, June 19, 1902.

Desiccated suprarenal, administered orally, has in the hands of most observers failed to influence attacks of hay-fever. Solis-Cohen noted a marked amelioration in the symptoms of hay-fever when a tablet of suprarenal substance was dissolved in the mouth every two or three hours. Some observers have noted an increase in asthmatic attacks after suprarenal.

The local use of suprarenal is followed by marked relief in most cases. Better than the desiccated suprarenal is a solution of adrenalin chloride, which may be used as strong as 1 to 1000, but is often efficient in the moderate strength of 1 to 5000 or 1 to 10,000. Wilson says for temporary relief in hay-fever it has no equal, and it causes less irritation than the solutions of the suprarenal gland.

When simple vasomotor rhinitis exists, with no discoverable local abnormality and no general dyscrasia, suprarenal extract used locally gives favorable results in a large proportion of cases. It entirely prevents, or much diminishes, the severity of the symptoms. In cases of hay-fever in which there is some local abnormality, the suprarenal does not act favorably until such conditions are remedied. In cases where there is a rheumatic diathesis, the suprarenal is liable to cause some reaction, and it does not act as favorably as in uncomplicated cases.

A Substitute for Silver Nitrate.—BARNES, A. C., and HILLE, H. *Medical Record*, vol. lxi, No. 21, p. 814, May 24, 1902.

The proposed substitute for silver nitrate is one of the new proteid combinations. Gliadin is a proteid of wheat extracted by hot dilute alcohol, and then dehydrated by absolute alcohol. Obtained in this way it is a white, friable mass. This is then treated in an autoclave under pressure for several hours, with dilute hydrochloric acid, there resulting a white granular precipitate. This substance

is not soluble in dilute and concentrated salt solutions, which classes it as a vitellin, a proteid found in the yolk of egg. It is then combined with silver, the resulting product being a dark brown powder which contains 30 per cent of silver, twice the quantity of any organic compound of silver heretofore prepared. It is very soluble, one ounce being readily taken up by two or three drachms of water. Solutions of this salt do not precipitate albumin or sodium chloride, and hence it has no coagulating effect upon mucous membranes, nor is it chemically changed by their secretions. Solutions of this salt penetrate deeply, as was demonstrated by exposing the thick strands of catgut for twenty-four hours in the solution, when it was found to have completely penetrated the strand. This power of penetration is such that it is thought that the salt will exert its antiseptic action deep in the tissues. It has been tried in 66 cases of acute gonorrhea and was found to be unirritating and produced a marked diminution of the inflammation. A one-per-cent solution was employed. It is believed that silver vitellin will revolutionize the treatment of inflammation and infection of mucous membranes. A 50-per-cent solution of this salt is equal to a 25-per-cent solution of silver nitrate, it has a higher penetrating power than the latter, and is without its caustic and irritating properties.

Salt Infusion in the Treatment of Morphine Poisoning.—WILLOUGHBY, E. F. *Lancet*, vol. clxii, No. 19 of vol. i, p. 1316, May 10, 1902.

A woman took eight grains of sulphate of morphine in three hypodermic injections less than one-half hour before coming under observation. She had no acquired tolerance of the drug. When seen the patient was semiconscious, but within ten minutes sank into profound insensibility. During the first hour one-fiftieth of a grain of sulphate of atropine and one-tenth of a grain of sulphate of strychnine was given. The latter drug caused spasm, the rigidity of the muscles markedly interfering with artificial respiration, which soon became necessary. At least a dozen injections of twenty minims of ether were given. Artificial respiration was continued for four hours. At this time natural respiration was reëstablished, but the patient was still in profound coma, and the faradic current applied to the soles of the feet caused not the slightest reaction. At this time a liter of salt solution was infused into the flank, the effect being immediate and striking. Within twenty minutes the dark hue and coldness of the skin had disappeared, and the patient was in part restored to consciousness.

The solution of potassium permanganate was given on the theory

that there is elimination into the intestinal tract of the salts of morphine. The morning following the ingestion of the drug, barring a certain soreness due to the artificial respiration, the patient was quite normal. The writer is of the opinion that the treatment employed was practically useless, excepting the artificial respiration, which sustained the vital processes until means could be provided for eliminating the poison, namely, the saline infusion. The permanganate of potassium, by destroying that which was excreted into the bowels, prevented its resorption.

The Effect of Digestion on the Styptic Properties of Gelatin.—Wood, H. C., Jr. *American Medicine*, vol. iii, No. 18, p. 729, May 3, 1902.

Reference is found in recent medical literature to the value of gelatin administered internally for the purpose of checking hemorrhage. The effect of digestion upon gelatin is the subject of the writer's experimental inquiry. Gelatin belongs to the group of foodstuffs known as albuminoids and behaves much like true albumin. When gelatin is acted upon by a mixture of pepsin and hydrochloric acid, it is converted into proto-gelatose, dutero-gelatose, and finally into gelatin peptone, corresponding to the three albumoses which are formed from the digestion of ordinary albumin. It has been claimed that gelatin administered hypodermically cannot be absorbed, as it is in a colloid substance, but the clinical experience in which the value of gelatin injections hypodermically is proven is now so extensive that the value of the method must be admitted. The effect of pepsin digestion upon gelatin does not alter its power to favor coagulation of the blood, but merely converts it into a dialyzable substance which is capable of absorption. The administration of gelatin by the mouth in hemorrhage is a rational procedure.

Subcutaneous Injection of Strychnine in Optic Nerve Atrophy.—Derby, H. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 20, p. 508, May 15, 1902.

In twenty-six cases of optic atrophy the writer has employed hypodermic injections of strychnine, and has been able to follow the cases a sufficient length of time to arrive at a fair estimate of the results. Fifteen of these were not relieved, the disease progressing and terminating in blindness; in one there was doubtful relief, and in two the improvement was temporary. In eight cases there was an evident cessation of the progress of the disease, and occasionally

a slight increase in the limits of the visual field and the acuity of vision. Strychnine was used in all the cases in gradually increasing doses, being injected beneath the skin of the temple. He begins with a solution of .04 grain, and adds .01 daily until the constitutional effects are observed, which are usually seen by the tenth injection. About this time the skin of the temple becomes sensitive, and a period of ten days is allowed to elapse in which the treatment is discontinued, and then the course is repeated.

Comparative Value of Cycloplegics.—BAKER, C. H. *Journal of the American Medical Association*, vol. xxxviii, No. 18, p. 1135, May 3, 1902.

An ideal cycloplegic should be safe, certain, and its effects should be of short duration. Atropine, the earliest discovered of the mydriatics, is certain in its action, is cheap, and its solutions keep well. Unfortunately it is not a safe mydriatic, as its toxic power is considerable. It is slow in its action, often requiring from one to two days for the complete mydriatic effect, and sometimes as much as fifteen days, or even longer, is required for the disappearance of its effects. A comparison of hyoscine, atropine, homatropine, scopolamine, in respect to safety, rapidity of action, and prompt return of accommodation, shows that hyoscine is in all respects superior to the other cycloplegics. After an extensive series of cases the writer has never failed to find hyoscine to show all of the refractive errors that could be discovered by any other cycloplegic.

Solanum Carolinense.—THRUSH, M. C. *Philadelphia Medical Journal*, vol. ix, No. 18, p. 802, May 3, 1902.

An extensive article upon this drug in the treatment of epilepsy is concluded by the statement that it is of value in *grand mal* of the idiopathic type without hereditary taint, and where the disease has begun after childhood. It is of value in hysteroepilepsy. In cases of *petit mal* it is of little value.

The writer classes solanum among the vegetable depressants, and generally speaking he regards these as being of more value than the bromides in certain cases of epilepsy, as they are devoid of toxic symptoms and the effect upon the mind which frequently follows the administration of the bromides.

The drug should be administered in the form of a fluid extract freshly made, beginning with one fluidrachm. The doses should be increased until the physiological effect is produced.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

An Examination of the Milk Supply of Baltimore. — KNOX, J. H. M., and BASSETT, V. H. *Maryland Medical Journal*, vol. xxxv, No. 6, p. 241, June, 1902.

In 1900, during the months of June, July, and August, there were 633 deaths among children under five years of age in Baltimore. Diagram No. 1 shows the relation of diarrheal diseases during the year 1901 to mortality from all other causes. That the temperature alone during the hot months of the summer is not the cause of the mortality, is shown by the fact that infants fed entirely upon breast milk as a rule escape summer diarrhea. In Holt's cases, 943 in number, it was found that but three per cent were exclusively breast-fed. The same writer states "that children among the poor in tenements enjoy immunity from intestinal diseases just in proportion as they are breast-fed, and just so long as they are so, but as soon as artificial feeding is begun, diarrheal diseases are prevalent."

Cow's milk must be the main reliance in the artificial nourishment of children. The most important element in the production of this disease among infants is a contaminated milk supply. Milk is an admirable culture medium. Considering the unhygienic surroundings of most of the milk delivered to the poor in our large cities from the time it leaves the filthy stable until it reaches the baby, it is not difficult to understand how it may be the cause of a high infant mortality. If the infant mortality in the summer season is to be materially reduced, a milk must be supplied in which the bacteria are reduced to a minimum and which contains no toxin incident to their growth. A product of this nature can be obtained during the warm weather only by great cleanliness in the handling of milk and by proper refrigeration.

To test the milk supply of Baltimore, samples were taken in March and April, and also in midsummer. The milk was obtained from different parts of the city, and an effort was made to have it fairly represent the general milk supply. The samples were immediately subjected to bacteriological analysis by plate cultures, and the acid determined by titration with decinormal sodium hydrate solution.

The general conditions of the milk supply show that many of the smaller dairies were very dirty. Many of the dispensing stations were clean, but sufficient attention was not paid to the measuring

DIAGRAM No. 1.

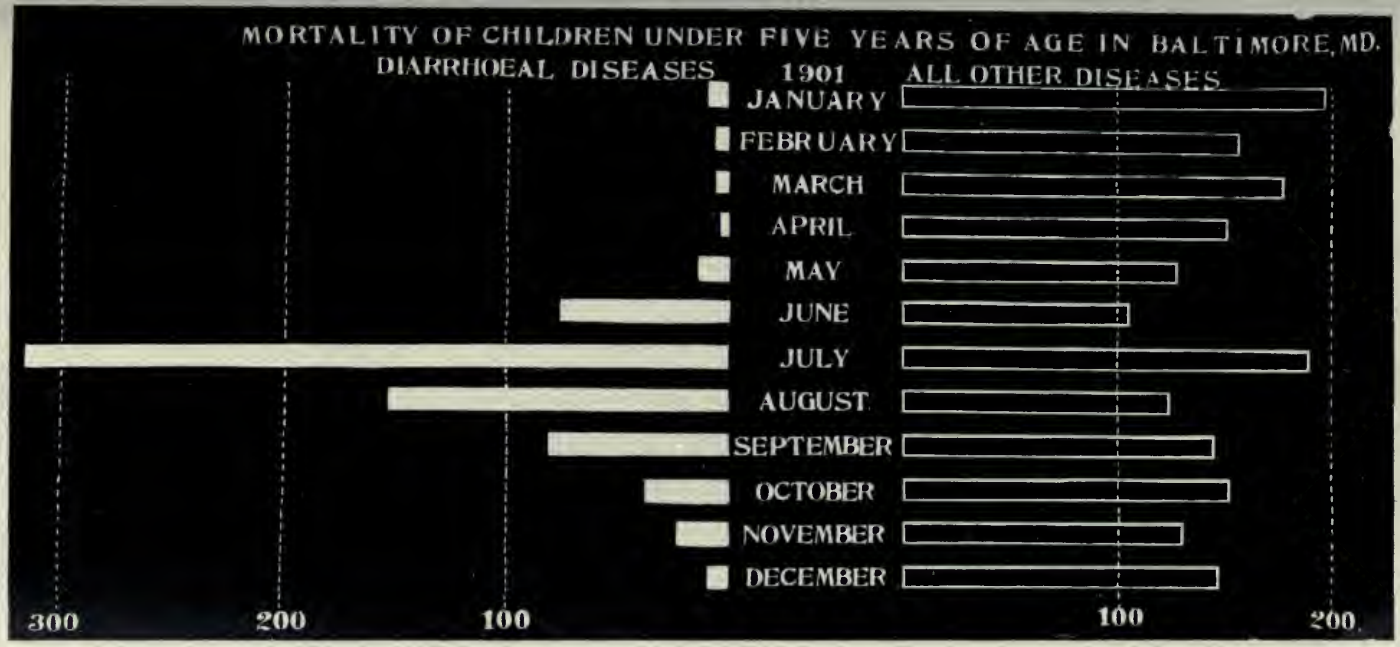
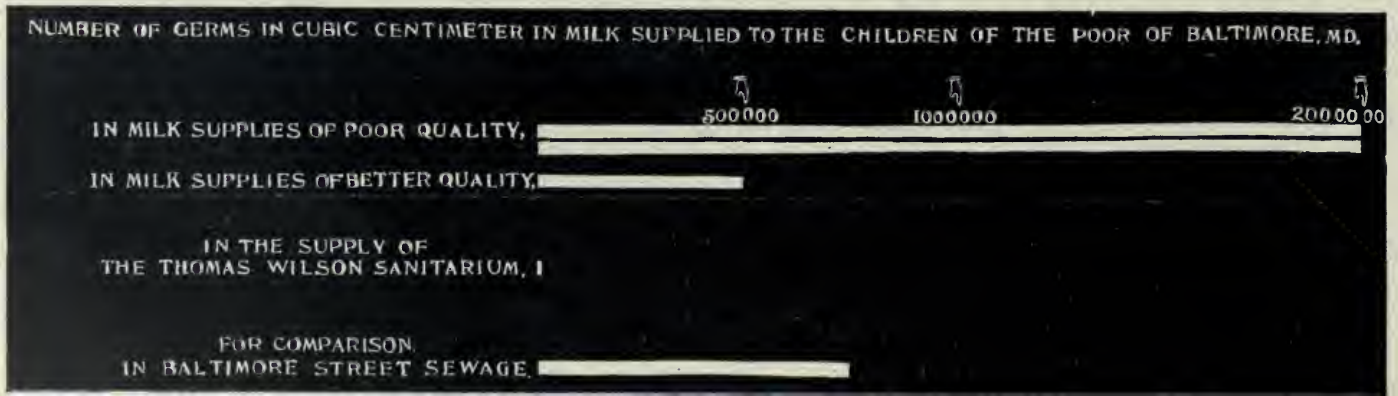


DIAGRAM No. 2.


NUMBER OF GERMS IN CUBIC CENTIMETER IN MILK SUPPLIED TO THE CHILDREN OF THE POOR OF BALTIMORE, MD.
500000
1000000
20000000
IN MILK SUPPLIES OF POOR QUALITY,
IN MILK SUPPLIES OF BETTER QUALITY,
IN THE SUPPLY OF
THE THOMAS WILSON SANITARIUM, I
FOR COMPARISON
IN BALTIMORE STREET SEWAGE.

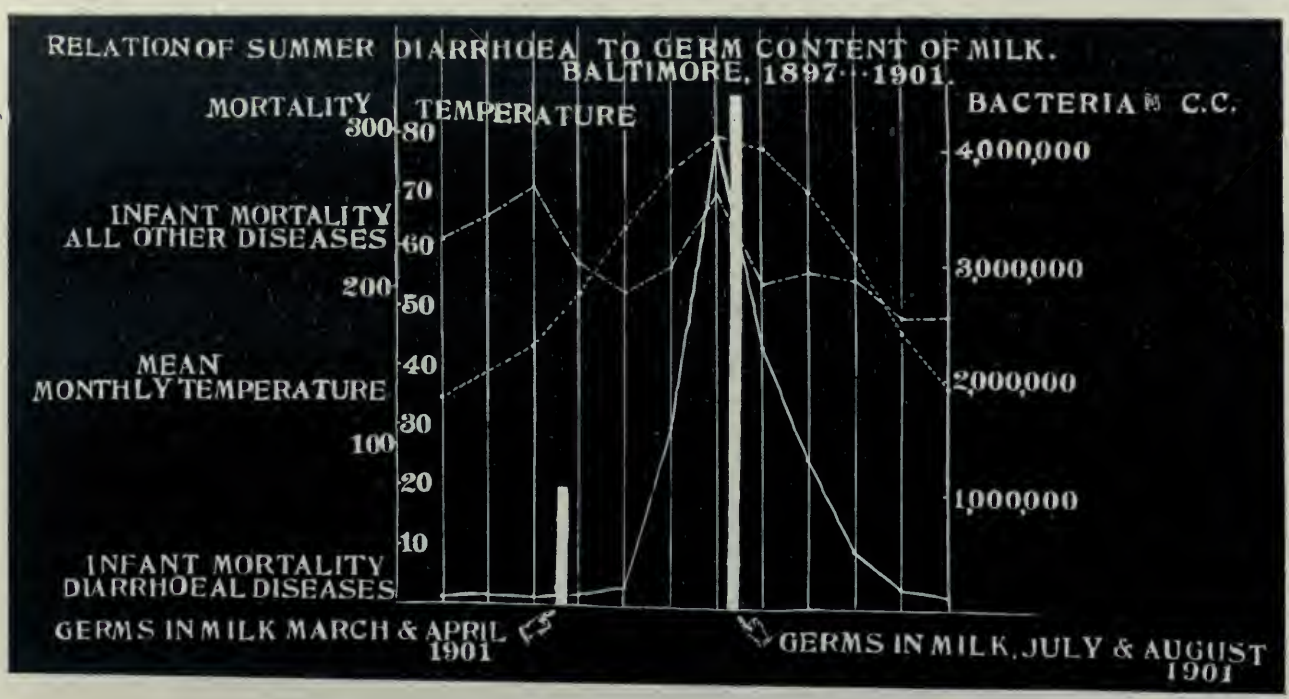

RELATION OF SUMMER DIARRHOEA TO GERM CONTENT OF MILK.
BALTIMORE, 1897···1901.
MORTALITY
TEMPERATURE
BACTERIA IN C.C.
300
200
100
80
70
60
50
40
30
20
10
4,000,000
3,000,000
2,000,000
1,000,000
INFANT MORTALITY ALL OTHER DISEASES
MEAN MONTHLY TEMPERATURE
INFANT MORTALITY DIARRHOEAL DISEASES
GERMS IN MILK MARCH & APRIL 1901
GERMS IN MILK, JULY & AUGUST 1901

DIAGRAM No. 3.

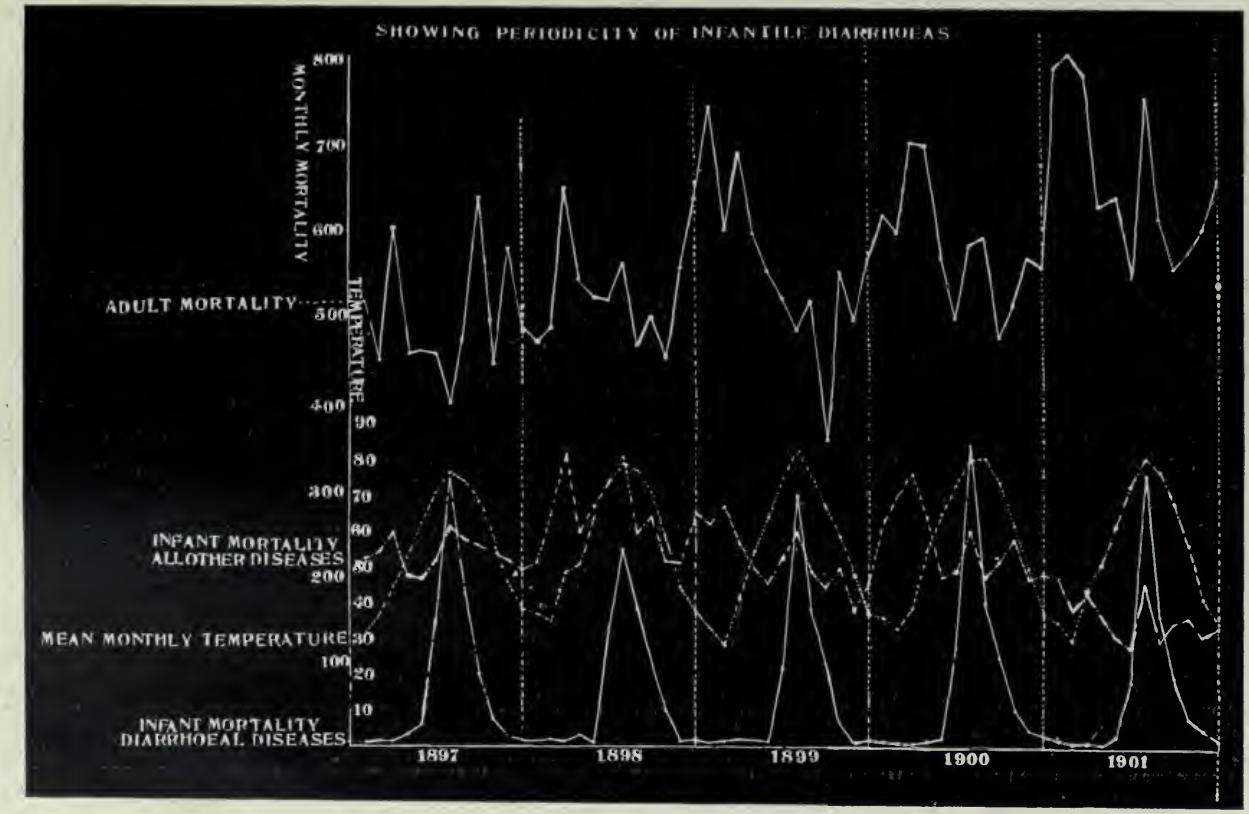

SHOWING PERIODICITY OF INFANTILE DIARRHOEAS
MONTHLY MORTALITY
800
700
600
500
400
300
200
100
ADULT MORTALITY
TEMPERATURE
90
80
70
60
50
40
30
20
10
INFANT MORTALITY ALLOTHER DISEASES
MEAN MONTHLY TEMPERATURE
INFANT MORTALITY DIARRHOEAL DISEASES
1897
1898
1899
1900
1901

DIAGRAM No. 4.

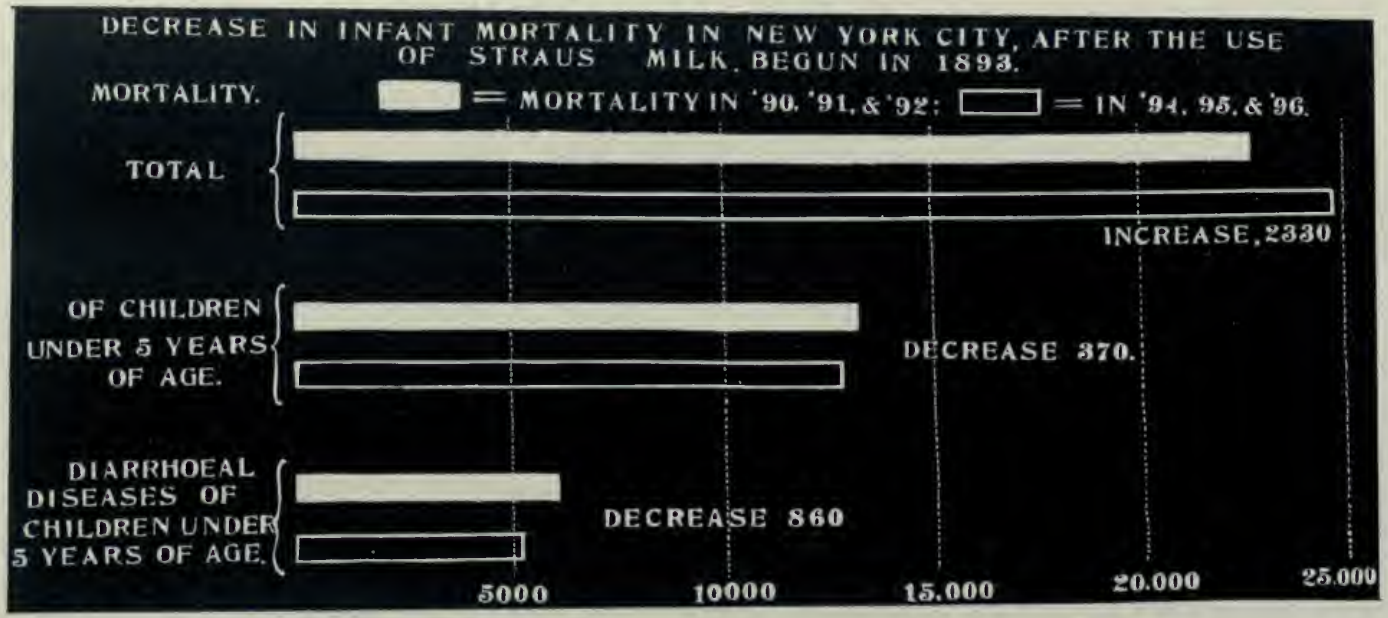

DECREASE IN INFANT MORTALITY IN NEW YORK CITY, AFTER THE USE OF STRAUS MILK, BEGUN IN 1893.
MORTALITY.
= MORTALITY IN '90, '91, & '92:
= IN '94, 95, & '96.
TOTAL
INCREASE, 2330
OF CHILDREN UNDER 5 YEARS OF AGE.
DECREASE 370.
DIARRHOEAL DISEASES OF CHILDREN UNDER 5 YEARS OF AGE.
DECREASE 860
5000
10000
15.000
20.000
25.000

DIAGRAM No. 5.

utensils, which were allowed to stand at room temperatures covered with flies, and then used to dip out the milk for a customer, thus liberally seeding the milk with organisms. Conditions were especially bad in small stores where the milk was not refrigerated, or was kept in large chests with meat or other provisions. The temperature at which the milk was kept was generally too high, averaging in summer 61.8° and in winter 57.7°. Practically 75 per cent of the milk dispensed in summer, and fully 50 per cent of that dispensed in the spring, does not meet the standard of total solids or fat percentage required by the city. The enforcement of the legal clinical standard provides for the food value of milk, but does not provide for its cleanliness and fitness for infant feeding. The dilution of milk with water, under commercial conditions, is by no means a harmless process. A distinct danger is in the planting in the milk of saprophytic organisms which are so common in water. By dilution the bactericidal power of milk is lessened and the rapid growth of bacteria is encouraged. The decreased sugar content allows the ordinary lactic acid fermentation to be quickly followed, and partially or most entirely replaced, by a change which is putrefactive in character. Gaseous fermentation is not uncommon in diluted milk. This is favored by high temperature and the addition of alkaline preservatives.

Examination showed that 20 per cent of samples obtained in summer contained formalin. Acid preservatives were not much used.

Bacteriological tests showed that 77 per cent of the samples received during the summer contained 1,000,000 bacteria per cubic centimeter, while in the spring but 40 per cent contained this number. Diagram No. 2 shows the number of germs in a cubic centimeter of milk supplied to the poor in Baltimore, with a comparison of the number of germs found in common street sewage. Diagram No. 3 shows the relation of the diarrheal diseases of infants to the germ content of milk in Baltimore during the period 1897–1901.

Simple and inexpensive modifications in the handling of milk would do much to improve the condition just noted. The average number of germs in twenty-two samples of milk secured under good conditions was 10,021 per cubic centimeter. Where the methods of handling were careless and little effort was made to avoid contamination, the average in twenty-five samples was 520,949 per cubic centimeter.

Diagram No. 4 shows that in Baltimore there has been a distinct decrease in the mortality, due largely to an increase in population

and a decrease in infant mortality, but there is practically no change for the better in that class of diseases in children generally known as summer diarrhea.

Diagram No. 5 shows the decrease in infant mortality in New York City after the use of Straus's milk, begun in 1893.

The Prevention of Ophthalmia by Crede's Method.—RUNGE, E. *Berliner Klinische Wochenschrift*, 39th year, No. 20, p. 462, May, 1902.

Hirsch (*Klinisches Jahrbuch*, Bd. iii, Heft 3) states that notwithstanding the application of Credé's method there are still a large number of cases of blennorrhea in the new-born. This method was applied to 962 children born in the clinic for women in Berlin, and 1.5 per cent suffered from blennorrhea.

The clinic for diseases of women in Göttingen shows better results with Credé's method. In the period since 1888 there were 1917 births in which no single case of early blennorrhea occurred, and only three of late infection, and all of these were slight. Gonorrhea is a frequent disorder in the maternity; in a series of cases in which this infection was carefully looked for it was found present in nearly 25 per cent.

In no case did more than a slight congestion of the conjunctiva follow the instillation of nitrate of silver, and this only when two-per-cent solution was used. When the method was first employed the stronger solution was used, but in the last 928 children a one-per-cent solution was instilled. The most important point in the technique is to instil the solution as soon after the child is born as possible. If an hour has passed, it may be too late to prevent the infection. It is probable that the neglect of this latter precaution has led to the reported failures in other clinics.

FORENSIC MEDICINE.

A Canadian Action for Malpractice.—TOWNE VS. ARCHER AND ARCHER. *Canadian Practitioner and Review*, vol. xxvii, No. 6, p. 314, June, 1902.

In the judgment delivered by Hon. Chief Justice Falconbridge there are some references to the early decisions governing malpractice. The case which was decided was that of a woman who having suffered an injury to the ankle brought suit, claiming that the defendants, Drs. D. Archer and A. Archer, had negligently and unskilfully treated it. A surgeon was appointed by the court to make a physical examination. He determined that there was a

dislocation of the astragalus forward and outward, that there was no sign of there ever having been a fracture of either the tibia or fibula. The deformity, it was claimed, was permanent, but it was thought that the parts would gradually become accustomed to their altered relations. The court held that the negligence of the defendants was not proven, as the plaintiff had, contrary to their directions, removed the dressings upon two occasions. In addition, it was held that the statute of limitations, which in Ontario seems to run only one year, had elapsed. While the court held that the latter was probably the case, yet it chose to overlook this and decide the case upon its merits.

The court held that malpractice (*mala praxis*) is bad or unskilful practice by a physician or surgeon whereby the health of the patient is endangered. Negligent malpractice means gross negligence and lack of the attention which the situation of the patient requires; as, if a physician while in a state of intoxication should administer improper medicines. What was charged in this case was ignorant malpractice, namely, a course of treatment which was calculated to do injury, which has done harm, and which a well educated and scientific surgeon ought to know was not proper in the case.

In 1697 the Court of King's Bench (Temp. Chief Justice Holt) resolved in Dr. Groenfelt's case "that *mala praxis* is a great misdemeanor and offence of common law (whether it be for curiosity or experiments, or by neglect) because it breaks the trust which the party has placed in the physician, tending directly to his destruction. The burthen of proof is upon the plaintiff in an action of this character, who should show that there was want of care, skill and diligence."

The general rôle and skill required of a medical man was summed up by Chief Justice Erle in Rich *vs.* Pierpont, 1862, 3, F. and F., p. 40: "A medical man was certainly not answerable merely because some other physician might have shown greater skill and knowledge; but he was bound to have that degree of skill which could not be defined, but which in the opinion of the jury was a competent degree of skill and knowledge. What that was, the jury was to judge. It was not enough to make the defendant liable that some medical man of far greater experience, or ability, might have used a greater degree of skill, nor that even he might have used some greater degree of care. The question was whether there had been a want of competent care and skill to such an extent as to lead to bad results."

Chief Justice Tindal in Lamphier *vs.* Phipos, 1838, 8 C. and P.,

p. 479, charged the jury: "What you will have to say is this: Whether you are satisfied that the injury sustained is attributable to the want of a reasonable and proper degree of care and skill in the defendant's treatment. Every person who enters into a learned profession undertakes to bring to it a reasonable degree of care and skill. He does not undertake, if he is an attorney, that at all events you shall gain your case, nor does a surgeon undertake that he will perform a cure, nor does he undertake to use the highest degree of skill. There may be persons who have higher educations and greater advantages than he has, but he undertakes to bring a fair and competent degree of skill; and you will say whether in this case an injury was occasioned by the want of such skill in the defendant.

"It has been held in some American cases that the locality in which a medical man practices is to be taken into account, that a man practicing in a small village, or rural district, is not to be expected to exercise the high degree of skill of one having the opportunities afforded by a large city, and that he is bound to exercise the average degree of skill possessed by the profession in such localities generally. I should hesitate to lay down the law in that way. All the men practicing in a given locality might be equally ignorant and behind the times, and regard must be had of the present advanced state of the profession and to the easy means of communication with the large centers of education and science. For instance, Fort Perry (the place in which this action had its origin) is a two hours' journey from a city with a quarter of a million inhabitants, with three medical colleges, and numerous hospitals."

It is understood that all original communications sent to this journal are for its pages exclusively, excepting in cases where articles are published in the transactions of the Societies before which they are read, or in which an abstract appears. Articles will be illustrated. Authors will be furnished a liberal number of reprints; or, if they so elect, an honorarium will be paid for original communications.

Books for review, exchanges, and all matters relating to the editorial management, should be addressed to Harold N. Moyer, M.D., 103 State St., Chicago, Ill.

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ORIGINAL ARTICLES.

FLATFOOT OR ACQUIRED VALGUS.

BY JAMES K. YOUNG, M.D., PHILADELPHIA, PA.

The diagnosis of flatfoot can usually be made by inspection, but more scientific means should be employed to render the diagnosis more accurate, and for purposes of record. A determination of the angle of inclination of the foot, and the pressure outline of the foot, are most important facts to be determined in arriving at an estimation of the degree of deformity.

The outlines of tracings are best obtained after the method of Rohmer[1] and Roberts.[2] The plantar surface of the foot is coated with some material and an impression is made upon prepared paper in such a way as to render it permanent. Many different materials have been employed for this purpose, and I have for many years used vaselin. The most satisfactory method for preservation is that indicated by Freiburg,[3] by which an impression is made with an alcoholic solution of tincture of iron and fixed with a solution of tannic acid.

In order to determine the angle of inclination I have selected the mediotarsal joint as the best line of measurement. This can be determined by marking a point on the foot half an inch behind the scaphoid tubercle on the inner side of the foot, and one inch behind the tubercle of the fifth metarsal bone on the outer side of the foot. A third point should be marked on the foot at the head of the first metatarsal bone by means of a crayon pencil. When the impression is made on the paper this crayon point will appear on the two points

[1] Les Variations de Forme Normales, Nancy, 1879.
[2] *Medical News*, March 20, 1886.
[3] *Boston Medical and Surgical Journal*, November 8, 1900.

on the other side of the foot to be marked before the tracing is made. These side points are connected, and indicate the mediotarsal joint. A perpendicular is erected upon this corresponding to the long axis of the os calcis, the angle of inclination is obtained by drawing an imaginary line from the junction of these two lines through the head of the first metatarsal bone (Fig. 1).

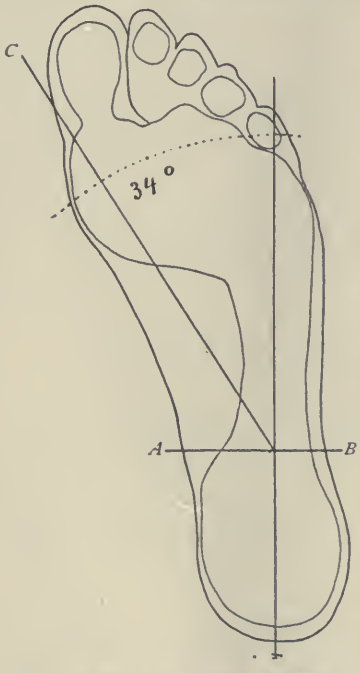

FIG. 1.—Outline of normal male foot, showing angle of deviation.

From numerous measurements made upon patients suffering from different deformities of the feet, it was found (Roberts) that the average in males was 34° plus, and in females 31° plus. In flatfoot the angle may be reduced as low as 5°, the average being 8° plus. In varus the angle of inclination may amount to over 60°, and Roberts considers all internal deviations in excess of 40° as abnormal. Thus, it will be seen in flatfoot we have an angle amounting to from 5° to 20°, in the normal foot the angle is from 20° to 40°, and in clubfoot the angle deviation is from 40° to 60°. I have devised a scheme which illustrates this, and which is represented in Fig. 2.

Another important means of diagnosis is the inclined mirror (Fig. 3), which permits the surgeon to inspect the impression made by the foot upon a plate of glass. This may also be used to make tracings, the outline being traced on the glass by an aniline pencil and transferred directly to a sheet of paper. In a recent case a diagnosis could not have been made but for the use of the inclined mirror; the impression of the foot on the glass displayed an increased pressure of the base of the second, third, and fourth metatarsal bones.

Differential Diagnosis.—The differential diagnosis of flatfoot should be made from (1) pronation, (2) breaking down of the anterior arch, (3) rheumatism. Osteitis may be present as a cause or effect, but its differential diagnosis is not difficult.

1. *Pronation* of the foot as understood to-day is the weak ankles

of yesterday. The pressure of the body weight upon the foot causes the inclination of the ankle inward. This may be more accurately determined by composite photography. By taking several photographs upon the same plate with the weight off and on the foot the amount of pronation of the inner malleolus, as well as its movement inward, can readily be indicated.

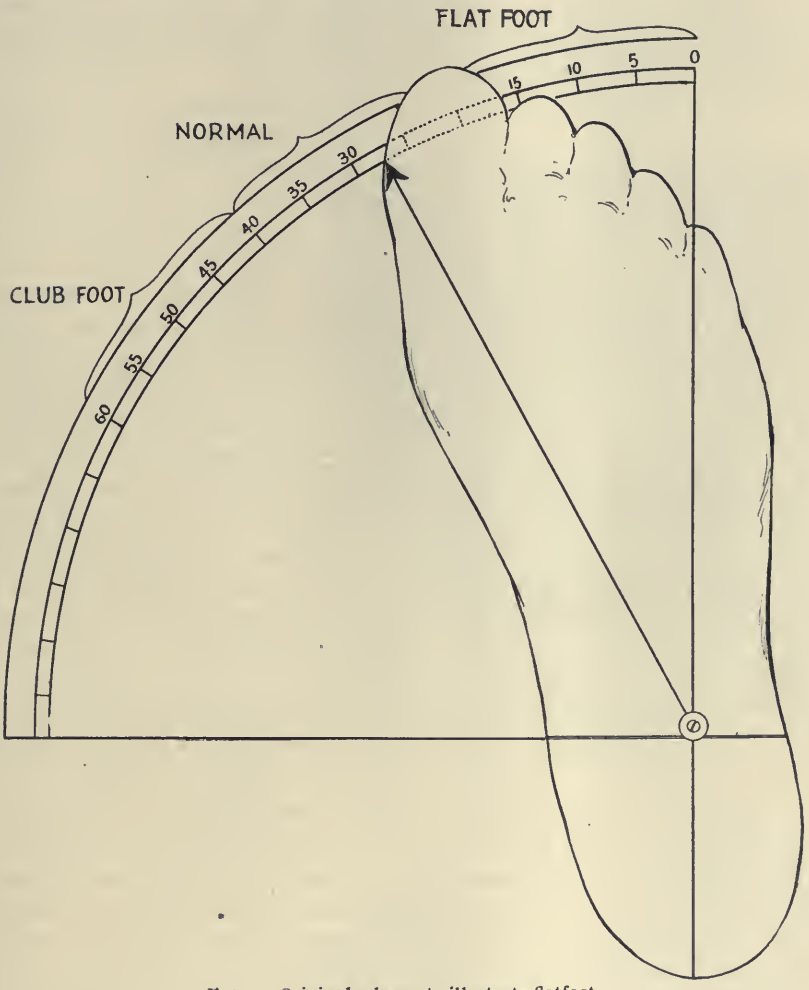

FIG. 2.—Original scheme to illustrate flatfoot.

2. *Breaking down of the anterior arch* produces a wider foot with frequently the formation of callus in the anterior part of the sole. This is best determined by the inclined mirror, and as its treatment is entirely different from flatfoot it should receive more attention than has been accorded to it.

3. *Rheumatism.* There is no affection so frequently confounded with flatfoot as rheumatism. Flatfoot frequently follows upon the relaxation caused by rheumatism, but flatfoot from many other causes is frequently confounded with rheumatism on account of its intermittent character, and the presence of inflammatory symptoms.

Rheumatism of the feet may be distinguished by the presence of rheumatism in other parts of the body, and by careful investigation of the clinical symptoms which accompany that affection, which exhibits itself in many ways.

Treatment. — The treatment of flatfoot should be modified to meet the three different stages: (1) mild, (2) medium, (3) severe.

FIG. 3.—Glass table with inclined mirror.

1. *In the mild form* the restoration of the arch may be accomplished by the use of a pad of gauze held in place by adhesive plaster and by a bandage. For permanent use this pad should be substituted by a plate, which may be made of different materials — steel phosphor-bronze, aluminum, German silver, and many other materials have been used. A steel spring coated with hard rubber has been used by the writer for a number of years, and of late has been replaced by rubber and celluloid plates. In adults it will be necessary to use a metal plate of some kind protected from perspiration by impervious materials. The shoe may be specially made, and a hard leather sole may be built into the shoe.

The plates, of whatever form, will hold the foot in position while the arch is being restored by exercises and massage. The principle employed in the application of plates in the treatment of flatfoot is founded upon the support of the astragalus. The relaxity of the ligaments, particularly the calcaneo-scaphoid or spring ligament, permits the astragalus to fall downward, forward, and inward, and

the plates should be so constructed as to overcome this tendency, and this is why the writer always employs a flange on the inner side of the flatfoot springs.

Exercises and massage form a most important part of the treatment. Special exercises are given consisting of special movements to develop the weaker muscles. These should be superintended by the surgeon in charge, and should be modified in such a way as to correct the deformity fully. Massage should always form a part of the treatment, and this would best be given immediately after the completion of the exercises.

FIG. 4.—Brace.

2. *In the medium degree* of flatfoot all the measures before described will have to be employed, and in addition forcible correction under ether has been found to be the most satisfactory method of treatment. At this time if tenotomy of the tendo achillis is found to be necessary it should be performed. After the forcible correction a suitable pad should be held in position in the sole of the foot by means of a plaster cast. This should be worn for two or three weeks, after which the treatment before described should be continued, together with the use of an ankle brace (Fig. 4).

3. *In the severe form* operative measures should be employed to restore the foot to a normal condition. These include operative procedures on the muscles and skin intended to shorten the arch of the foot by cicatricial contraction, and shortening or elongation of the tendons, as is necessary. The removal of the astragalus has been performed in most severe cases, but only in the most exceptional cases would this become necessary.

222 SOUTH SIXTEENTH STREET.

PES EQUINOVARUS.

BY GWILYM G. DAVIS, M.D.

The name clubfoot when used in a general sense is often applied to several different varieties of deformity of the feet, such as varus, valgus, cavus, equinus, etc. In its more restricted sense it is used to designate the special form in which the foot is turned inward, pes varus, and in which oftentimes the heel is elevated, constituting equinovarus. Many of the deformities of the feet are acquired, being the result of paralysis, injuries, diseases such as rheumatism, and other causes. Equinovarus, while sometimes acquired, is usually a congenital affection, and exists in a more or less marked condition from birth. As a rule there is no difficulty in diagnosing it. The foot is turned inward; usually both are affected, pointing toward each other instead of forward. It is so marked that the mother will notice it and bring it to the attention of the physician. Therefore this affection, like so many others, first comes to the notice of the family practitioner, and to him belongs the responsibility of advising as to its treatment. There are some deformities, such as bow-legs in rachitic children, which seem at times to improve and diminish as the child grows. Hence radical measures of treatment in such cases can often be deferred or avoided. This being so has apparently led some to advise deferring treatment in cases of clubfoot.

Cases are continually applying for treatment where the child may be several months or more old without any serious effort having been made to correct the deformity.

Equinovarus is not like the rachitic diseases of the long bones; it does not tend to improve. On the contrary it tends to become aggravated and more marked. A foot readily straightened by manual pressure soon after birth becomes set in its distorted position. The contracted muscles become shortened and the bones become deformed in shape and hardened, thus preventing reposition. Such being the case it is evident that the earlier treatment is undertaken the easier the deformity will be corrected; therefore attention should be given to the deformity almost from the time of birth.

The question suggests itself as to what is the duty of the practitioner in these cases. Deformities in children are only to be corrected by long continued, intelligent, and persistent treatment. Equinovarus in its earliest stages can be quite successfully handled by the physician if he is fairly well informed and occasionally

consults a specialist to be sure that the treatment is progressing satisfactorily. There are some cases, it is true, that are so severe and obstinate as to tax the resources of even the most skilful, but most of them can have the greater part of the treatment intrusted to the family physician, provided he is willing—and all are not—to give it the attention it requires. If a child, soon after birth, is discovered to have clubfoot, the first thing to do is to have judgment passed on the degree of severity of the deformity and to outline a plan of treatment. The mother should not be told to wait until the child is older, unless it is expected to die soon, neither should she be referred to the surgical instrument maker. If the physician himself does not feel capable of advising at once as to treatment, then he can consult a specialist, who can outline a plan of treatment for him to carry out.

The character of the treatment will vary according to the age and condition of the child and the severity of the deformity.

The age and condition go hand in hand. If the child is in good physical condition active treatment can be instituted at once, no matter what its age—it cannot be too young. If, however, it is so weak and sickly as to be likely soon to die, it is obviously unwise to worry and distress it with attempts to correct a deformity which will not manifest its disabilities until the child begins to walk.

There are three different stages in the treatment of a case of moderate severity.

The first stage is that of manual correction; the second is that in which bandages, splints, and other simple appliances are used; and the third is that in which apparatus made by the instrument maker are worn. In these last two stages the question of tenotomy may arise.

The first stage—that of manual correction—may usually be instituted as soon as the case is seen. It consists in straightening the foot by the hands so as to bring it as near as possible to its normal position and to stretch or compress the resisting structures. The mother or nurse should be taught and shown by the physician how this is to be done.

The leg is grasped low down around the ankle with one hand while the foot is first turned out in a line with the leg with the other hand, and then flexed on the leg so as to stretch the tendo achillis. Sometimes a considerable degree of force is necessary in this manipulation, and usually the child cries.

This stretching is to be done by the mother or nurse at least twice a day and perhaps oftener. If the child is weak and sickly

the stretching should be mild, but if it is strong and hearty, a proportionate amount of force may be exerted. If the leg is firmly grasped around the ankle no harm will ensue.

This stretching should really be continued until the case is cured, though ofttimes the parents get tired and cease it. After a few days or weeks the next step may be instituted. This consists in applying a bandage and splint. The bandage is a two-inch white flannel one and the splint a plain right-angled gutter made of strong sheet tin or iron. While one person holds the foot as nearly as possible in a corrected position another applies the bandage from the toes to the knee. In applying the bandage it should be carried under the sole of the foot from the inside to the outside so that it draws the foot outward. The bandage having been applied, the foot is laid in the splint, at right angles to the leg, care being taken to see that the heel is as well down in the splint as possible. Sometimes, owing to carelessness or inefficiency, if the case does not seem to be progressing satisfactorily, the plan of stretching and fixing in plaster of Paris may be tried. It is a very effective method and severe cases of deformity can be unfolded by its persistent employment. In using it the foot is first thoroughly stretched with the hand. It is then to be bandaged with a white flannel roller, the foot being held in as well corrected position as possible. Several thicknesses of bandage are used to serve as padding. A plaster-of-Paris bandage is next applied, and when completed the foot is firmly stretched into as good a position as possible and held there until the plaster has hardened. Thus the foot is retained in place. This bandage is left on for a week and then removed, the foot bathed, and another stretching given and new bandage applied. Thus the foot by the repeated stretching and bandages is gradually turned outward and the deformity overcome. The use of the plaster bandage in extremely young children is not satisfactory sometimes, on account of the difficulty of securely holding the foot, so that splints reapplied once or twice a day are usually preferable. The application of the splints or plaster bandages or both is continued for perhaps several months, at least until the foot with a moderate degree of force can be turned out in line with the leg and then flexed at right angles to it. The child may be six months or more old by this time, according to the age at which treatment was begun. Especial effort should be made to straighten the foot sufficiently to allow the use of a brace by the time the child attempts to stand on its feet and walk. When this time arrives, or even sooner if the foot is ready, a clubfoot shoe made by the instrument maker may be substituted. These may be perfectly

simple, and they need have no screw movements. They consist of a shoe, opening clear to the end of the toes, fastened to side irons which go above the knee, with joints at the ankle and knee. A rubber band passes from the shoe to the side iron. The shoe is made open to allow the foot to be firmly pressed into it, a strap is fastened over the instep which serves to hold the foot in the shoe while it is being laced. The elastic strap is then buttoned to the side iron and serves to exert a steady slight tension on the tendo achillis. If this strap is too tight, pain will be caused and the foot will turn in the shoe.

The side irons are carried above the knee because experience has shown that they prevent rotation and are thereby rendered more efficient. If on using the brace it is found impossible to keep the heel down in the shoe, then it should be discontinued and the child put through a few weeks' course of stretching and plaster of Paris as already described.

This treatment will suffice for cases of moderate severity. When obstinate cases are encountered, in which it is difficult to bring the foot in line with the leg and impossible to bring the heel down, then tenotomy of the tendo achillis, often with division of the plantar fascia, is the first operative measure to be employed. This may with propriety be resorted to in exceptional cases in quite young infants. In rare cases tenotomy of the anterior and posterior tibial tendons may be done.

Cases of clubfoot apply for treatment at all ages, and the older the patient the harder the bones, which may by this time have become distorted, and the more severe are the measures necessary to obtain satisfactory results. It is usually above the age of six years that it is necessary to resort to these operations, but occasionally younger children, sometimes as young as two years, may have feet so resistant and distorted that to rely on stretching and plaster of Paris, even though aided by tenotomy, would entail too much care on the part of the parents and too much suffering on the part of the child.

If tenotomy has once been done, a second division of the same tendons will rarely cause the foot to yield much, so that they should only be divided in those cases in which we feel sure no further operative measures will be required.

The more severe operative measures consist either in dividing the contracted tissues on the inside of the sole of the foot, as advocated by A. M. Phelps, a simple osteotomy of the astragalus, or even clear across the tarsus, or the removal of the astragalus or a

wedge-shaped piece of the tarsus irrespective of the joints. Of these the wedge-shaped resection is my choice, and my belief is that the others are but rarely desirable.

A simple osteotomy across the tarsus does not allow of sufficient mobility and can only produce a satisfactory position of the foot if the deformity is not severe. Such cases can be cured by tenotomies and stretching, with the subsequent application of plaster of Paris.

The foot is composed of two longitudinal arches; they unite posteriorly in the calcaneum, but anteriorly the inner one embraces the astragalus, scaphoid, and cuneiform bones and the inner three metatarsals. The outer arch is continued forth in the cuboid and outer two metatarsal bones. In marked cases, and it is only in such that these operations are to be done, the bones are distinctly deformed. The operation of Phelps does not involve the bones, but only the soft tissues of the foot, hence the deformed bony arches remain more or less in their distorted position, and tend to perpetuate the deformity and favor a relapse.

Astragalectomy removes one bone from the inner arch, and does not disturb the outer arch, but it allows the foot as a whole to be turned outward. Therefore we find it leaves the patient with a foot nearly as much deformed as ever, only tilted more outward. The bending inward of the forward part of the foot persists, and while fairly satisfactory results can be obtained in a few cases, the relief both from the deformity and disability is only partial, and I have operated subsequently on such, and have just seen one which is to return later for another operation.

The removal of a wedge of bone while not by any means ideal still enables us to make the best possible correction. As done by myself, it consists in making a straight incision over the projecting hump in front and to the outer side of the ankle, extending from the tendon of the little toe in front to the peronei tendons behind.

The peroneus tertius tendon, if seen, may be pulled forward and the peronei longus and brevis displaced backward. No tendons need to be cut, and through this incision sufficient bone is removed by the chisel and gouge, clear across the tarsus, to enable the foot to be brought absolutely straight without much tension. In rare cases it may be desirable to divide the tendo achillis. The elastic tube or tourniquet is used to prevent hemorrhage during the operation, and the foot is placed in plaster, the wound being closed with two or three sutures without drainage. The subsequent use of braces is usually unnecessary.

The causes of failure in the treatment of clubfoot are lack of knowledge both in the surgeon and parent or nurse, and carelessness. Eternal vigilance is the price of good results, and these cases demand so long continued attention that the parents allow the braces to become worn out and inefficient or they fail to attend properly to the stretching and bandaging.

The better attention these patients receive the less operative procedures will it be found necessary to resort to.

Sometimes the parents, at other times the doctors, are too timid, and afraid to stretch the foot sufficiently, and do not make it a point to see that they are doing at least enough to accomplish their object. If the general practitioner took a little more interest in these cases when he first saw them, oftentimes at or soon after birth, and consulted a specialist as to the course to be followed in each particular patient, and if the specialist at such times would render to the practitioner such counsel and aid as would serve him at least for a time, then we would have these cases treated while they were in a condition to respond to mild measures and we would see fewer old, distorted, hardened, and crippled feet.

ON THE TREATMENT OF TALIPES EQUINOVARUS.

BY J. P. MANN, M.D., PHILADELPHIA,

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A few preliminary considerations bearing on the subject under discussion will, perhaps, lead to a clearer conception of the views expressed in this paper. Talipes equinovarus, a deformity in which the heel is permanently elevated and the foot turns inward, may be either congenital or acquired. Of all malpositions of the foot it is by far the most common, occurring in three-fourths of all congenital clubfeet and in one-third of the cases in which the condition is acquired. All statistics agree that congenital talipes equinovarus is seen more frequently in the male than in the female, and that one foot is affected nearly as often as both. On the other hand, in the acquired form unilateral involvement is more often encountered. Whether the abnormality occurs before or subsequent to birth, the right foot is more frequently deformed.

All parts of the foot participate in the deformity, and in many instances the entire limb, especially at the knee- and hip-joints, is markedly changed from the normal.

Positional and relational changes are quite noticeable in the astragalus, os calcis, and scaphoid bones. The ligaments between the scaphoid, os calcis, and internal malleolus, all structurally changed, are exceedingly resistant tissues. The tibialis anticus and posticus, the gastrocnemius and soleus, are the muscles which are most active in retaining and increasing the deformity. Many cases, seen early enough, readily yield to corrective measures, but it should be borne in mind that with increasing age the parts become less tractable.

Classing manual correction as mechanical, the treatment of talipes equinovarus is: (1) Mechanical; (2) operative, or (3) by a combination of the two.

Mechanical devices are both multitudinous and multiform, and many of them are of very doubtful value, hence those only which have seemed to prove efficient will be mentioned in this purposely brief and general study of the subject.

Manual correction, always tedious, is applicable during the first four or six weeks after birth. Now and again a faithful parent or nurse will remedy the deviation by the hand, but this method is not to be depended upon except in a limited number of cases.

Manual correction, the elastic band and adhesive or other strips, all agents used to restore the foot to its normal position, serve best as adjuncts to other more certain plans of treatment.

Treatment by the plaster bandage or by some form of simple splint is far more efficient than any of the above mentioned measures. Whether one employs a plaster bandage or a metal splint the same principle applies. The surgeon, by a weekly re-application of the plaster bandage or by frequently bending the splint, aims to gradually force the foot into proper position.

If the plaster bandage method of adjusting the deformity is preferred, the foot should be well covered with absorbent lint or cotton to protect it from the rough plaster. Constriction of the foot sufficient to stop its blood current will cause gangrene within a day or two, and undue pressure of the plaster dressing over bony prominences produces ulceration quite quickly. The toes should never be covered by the plaster dressing, since their exposure affords constant opportunity for ascertaining the condition of the circulation. If the plaster case be too tightly applied a linear incision extending through its entire length will allow the foot more room. Should there be undue local pressure a trap-door cut in the plaster splint over the point of irritation secures speedy relief. Treatment by the plaster splint, in careful hands, will not lead to atrophy; on the contrary, the treated foot will be distinctly larger than its neglected and deformed fellow. This method has no insuperable difficulties, and is worthy of a trial in a large majority of instances. It can be used prior to the institution of operative measures, and will always help if it does not secure complete restoration.

Correction of talipes equinovarus by a simple metal splint, which is ordinarily attached to a suitable shoe, is a very effective and widely recognized method. Intelligently and persistently applied it assures a fairly speedy relief in many cases. If limited to a choice of one of the last two plans of treatment, the simple metal splint should be selected, because it can be readily conformed to the foot, daily if necessary, and can be used for months or years, allowing the subject to walk at will and with freedom of motion. The plaster bandage plan is usually employed for a few weeks or months. Both of these corrective plans are employed as retainers in the post-operative treatment of the deformity; the plaster bandage being applied during the four weeks just subsequent to operation. When the plaster case is removed a suitable metal brace and a shoe are used to maintain the normal position of the foot. Complicated metal braces are mentioned only to be condemned. The patients

and their parents cannot properly handle them, and frequently they are too much for the surgeon.

From an operative standpoint the procedures to be considered are: (1) tenotomy; (2) division of ligaments and fasciæ; (3) open incision or Phelps's operation; (4) bone operations, and (5) *brisement forcé*, or the use of extreme force.

Correction by tenotomy needs little discussion. Limited to those cases in which there is little or no involvement of the other foot structures, it will prove efficient, and if followed by suitable after-treatment a permanent reposition is the usual result.

Where fasciæ and ligaments are greatly involved in the deformity, they must be stretched, torn, or divided by the knife, and it will also be necessary to resort to tenotomy in this class of cases.

Phelps's operation or open incision consists in a division of the resistant parts though a transverse opening on the inner border of the foot near the tarsometatarsal articulations. This operation is combined with sufficient mechanical force to overcorrect the deformity. The foot is now dressed, a plaster bandage is applied, and elevation maintained. The large open wound closes by granulation in from one to three months.

The gaping, granulating wound left by this operation invites sepsis and unnecessarily mutilates the foot. The writer has not infrequently observed the occurrence of infection in open operations, and in order to relieve pain and control the septic process it was necessary to remove all restraining apparatus. The usual result in such instances was the return of the foot to a position less useful, more deformed, and less operable than before. These and other reasons strongly point to the avoidance of Phelps's operation.

Osteotomy of the astragalus, astragalectomy, cuneiform osteotomy and other bone operations are resorted to in the correction of talipes equinovarus.

Krauss, Wolff, Bradford, Lovett, Lewis, Reginald Sayre, Lorenze, Young, Allis and many other authorities affirm that the deformity can be corrected by section of the nonosseous tissues aided by force and retentive appliances. This is a strong statement, whose accuracy has been amply attested.

Quoting from H. A. Wilson's paper on "Bone Operations for the Correction of Clubfoot,"[1] Shaffer, replying to Dr. Wilson's question: "How many bone operations have you performed for the cure of clubfoot?" says: "If your query were: How many

[1] Reprint from the Transactions of the American Orthopedic Association, September, 1893.

cases have you had which have been condemned to osteotomy and which you have cured without operation? I could give you some statistics." Lorenz says: "I consider every bone operation in clubfoot as a mutilation of the foot and as a criminal act to the practice." Wilson remarks in his paper that: "A very large majority, if not all, could be corrected by soft structure section, either with manual or mechanical stretching and tearing," with adequate postoperative treatment.

Willard says: "My typical results are in those cases corrected without the removal of bone" and "I find it unnecessary to remove any bone except in cases where the dislocated head of the astragalus is too large to be returned to its normal position." "The dimensions of the bones are readily determined by the *x*-rays."

James K. Young says: "I regret that I have no bone operations to report." Thus it appears that leading orthopedic surgeons if at all possible avoid bone operations for the rectification of talipes equinovarus.

The writer has never found it necessary to resort to operation on the bone for the correction of clubfoot.

Through *brisement forcé*, which is the application of manual or mechanical means of treatment either separately or combined, one can, in many cases, more or less gradually compel the foot to assume a normal position. It is a very efficient plan of treatment, but is generally supplementary to operative methods.

Open tenotomies, open section, and bone operations have seemed unnecessary in the more than seven hundred deformed feet that have come under the writer's care.

Subcutaneous division of the involved soft tissues, aided by stretching and tearing, has been adequate to the correction of the most resistant foot. Open operations will correct deformities, but subcutaneous division will produce the same result with less risk of sepsis, less mutilation of the foot, less pain to the patient, without any exposed cicatrices, and with greatly decreased postoperative contraction; thus insuring a stronger, more shapely and more useful foot than can be obtained by open operation.

Sepsis is almost unknown to the careful subcutaneous operator. The author never had a case. The careless surgeon is incompetent to operate on clubfoot or anything else. When sepsis appears in subcutaneous work it is just as readily opened and cleansed as is an open section, which, owing to infection, must be reopened after having been sutured. Does not every single wound that is thus sutured become, in reality, a subcutaneous operation?

It is not difficult to identify subcutaneous structures requiring division. Important nerves or vessels are easily avoided, and such operations consume much less time than open work, and at the same time they shorten postoperative treatment. It is needless to say that where one desires to shorten a tendon open operation must be performed.

Following operation, fixation of the foot in an overcorrected position should be maintained by plaster bandages applied from the toes to just above the knee-joint. The foot is thus molded and forced into the required position. The bones and soft tissues will all yield to the continuous pressure of the rigid dressing.

The plaster bandage should be removed weekly for inspection of the foot, and neglect of this precaution may result in serious pressure injury. When changing the plaster case, if the correction is unsatisfactory, opportunity is afforded for anesthetizing the patient and using leverage for further correction. This will often be essential to reposition in severe cases.

Subsequent to treatment by fixed dressings a retaining shoe and brace must be worn for varying lengths of time. In marked deformities of children these are worn until about the twelfth year, when ossification is completed. In adults the time will vary with the degree of deformity.

After discarding apparatus, both children and adults should be kept under observation, and if there is any tendency to relapse the supports should at once be reapplied.

I exhibit a boy of seventeen, on whom an operation for talipes equinovarus was done by the subcutaneous method, dividing the tendons and fasciæ. The result was eminently satisfactory.

The writer believes that no *congenital clubfoot* should be operated on until the child has learned to walk, which occurs usually from the twelfth to the twentieth month after birth. With skilful manipulation and, if necessary, retentive apparatus, many cures can be effected when there is a slight deformity; severe cases, however, require, besides operation, mechanical treatment both previous and subsequent thereto. Some children with clubfoot are not of robust build, and will become victims to some of the infant maladies, and thus early operations are rendered useless. Why add shock from operation and anesthetic to the already too long gauntlet of children's enemies? Mechanical treatment, judiciously selected and applied, will never cause a death; an operation, however, skilfully performed, may be "the last straw" under which the little one sinks into an early grave. When a child can walk, in addition

to suitable apparatus, its body weight very materially contributes to the retention of the foot in the corrected position. A pressure of from fifteen to thirty pounds, controlled by mechanisms constantly acting while the patient stands erect, is without doubt a powerful corrective agent. Further, it must not be forgotten that many cases are assisted to a cure by properly directed muscular action. The infant's foot is so small and the tissues are so tender that, in operations done too early, unless the surgeon can make frequent visits and the parents are more painstaking and intelligent than usual, it is very difficult to avoid either a partial or complete relapse, even where apparatus is worn. The failures, one excepted, witnessed by the writer, resulted from operating too early, from neglect of treatment, or they occurred where open section was done. In the excepted case a concurrent scarlet fever, which began a day or two after operation, necessitated the cessation of further efforts to correct the clubfoot.

THE CARE OF THE PERINEUM DURING LABOR AND THE PUERPERIUM BASED ON A STUDY OF FIVE HUNDRED AND FOURTEEN CASES.

BY EFFA V. DAVIS, M.D., CHICAGO.

In looking through the text-books on obstetrics, one is impressed with the great number of methods outlined for preventing rupture of the perineum in labor. The many positions suggested for the obstetrician's hands, the division of opinion as to the position of the patient, and the various theories in regard to "support of the perineum," are bewildering to the beginner.

The various maneuvers outlined resolve themselves into the following principles:

1. Control of the expellant forces.

2. Directing the presenting part into and through the vulvar opening.

3. Manipulations of the obstetrician to relax or support the perineum.

1. To control the expellant forces various suggestions are offered, as (*a*) directing the parturient to check or increase the voluntary expulsive efforts; (*b*) permitting her to cry out or breathe rapidly through the mouth; (*c*) placing her on the side to remove the force of gravity; (*d*) the use of chloroform—beginning its administration as soon as the presenting part touches the pelvic floor or begins to bulge the perineum with each uterine contraction; (*e*) direct pressure on the head or presenting part applied in such a way as to press the part back into the birth canal in the axis of the vagina and well under the pubic arch, thus removing the strain on the perineum, and allowing the element of time to act in more perfectly preparing the elasticity of the soft parts.

This principle of applying counter-pressure to the presenting part was advocated by Hohl and afterward taught by Olshausen. Various positions of the hands, fingers, thumbs, and parturient patient have been advocated in applying this pressure. Hohl placed the patient on the back with the thumb anterior to the occiput and the index and middle fingers posterior upon that portion of the head which lies nearest the commissure. The hand thus controls, to some degree, flexion and extension, and the too rapid exit of the head. Olshausen has highly commended this maneuver.

Ritgen practiced lifting the head through the vulvar opening between pains, by an upward and forward pressure exerted by the tips of the fingers upon the perineum, *behind* the anus, close to

the extremity of the coccyx. He practiced this method as early as 1856 (first published in the *Leipziger Klinik und Poliklinik* in 1867).

This idea was modified by Olshausen and Ahlfeld by hooking the fingers through the rectum under the chin or in the mouth, and expressing the head between pains by an upward and forward pressure. Olshausen also advocated the lateral position for the patient, as it relieved the force of gravity and gave the obstetrician a better view of the perineum.

2. In directing the presenting part through the vulvar opening, the short suboccipito-bregmatic diameter of the head must be made to engage and pass the vulvar opening by keeping the head flexed sufficiently to permit the full escape of the occiput under the pubic arch before the sinciput passes the perineum—the lower part of the face is pressed upon through the rectum or posterior portion of the perineum, as before suggested by Ritgen, Olshausen and Ahlfeld, and the occiput held down by hooking the fingers of the same hand over it, or by placing the fingers of the disengaged hand passed between the thighs against the portion of the occiput already born, forcing it outward and the chin upward, and at the same time crowding the whole head upward to fill the available space under the pubic arch.

Fasbender suggested a reverse position of the hand as described by Olshausen, the fingers of the right hand hooked over the occiput and the thumb far into the rectum. Flexion and extension can thus be controlled and expression effected by the thumb.

3. Manipulations of the perineum itself have been advocated to render it more elastic and to distribute the tension. Massage with fats before labor, the application of hot fomentations during labor, and the manual dilatation by introducing two fingers into the vagina and drawing the perineal structures outward, are methods commonly used. Goodell practiced drawing the perineum forward over the head toward the pubis by applying the left hand in such a way as to hook the first two fingers far into the rectum and the thumb over the occiput, thus drawing forward with the perineum the anal ring, to utilize the elasticity of the former to its full degree and insure a complete dilatation of the vulvar opening.

Playfair applied the hand so as to push the perineal tissues forward over the head by applying the thumb and two fingers on either side of the vulva, with thumb pointing toward the pubes.

Dr. Garrigue takes the elongated head when molded to represent a cylinder. To pass an elastic ring easily, it must have its axis at

right angles to the border of the ring. This cannot happen if the perineum be pushed up or back, which displaces the posterior portion of the ring. Ramsbotham, Baudelocque, Cazeau, and many others have advocated direct pressure to the perineum by placing the palm of the hand over it and making pressure during the pain. The term "supporting the perineum" most often means nothing more than this. Mechanical devices have been suggested to take the place of manual support, such as a towel held in the hands of two assistants who make direct traction against the perineum during a contraction. One of the late journals contains an article advocating strips of adhesive plaster firmly applied around the body so as to cross the perineum and give a firm resistance to the oncoming head.

Episiotomy, proposed by Ould in his Treatise on Midwifery, 1742, has also been a method calculated to preserve the structures from more serious injury.

Goodell in summing up the subject in his Lessons in Gynecology says: "One advocates pressure on the perineum with a folded napkin, another with an unfolded napkin, a third scouts all napkins whether folded or unfolded. One plugs up the rectum, another empties it. The perineum is pushed forward by some, and backward by others; some place their hands transversely across the perineum; some longitudinally with fingers looking downward, some longitudinally with fingers looking upward, as runs the nursery rhyme, 'Simon says thumbs up! Simon says thumbs down!' and yet the perineum tears, and tear it will until woman becomes like the cherubs of the old masters—'all wings and no body.'"

The per cent of ruptures has been variously stated: Olshausen considered fifteen per cent not too high for unavoidable laceration due to defective distensibility of the perineum and disproportionate size of the child's head. In ten years' work in Halle he gives 21.1 per cent of ruptures for primiparæ and 4.7 per cent in multiparæ. Winckel reports 115 in 1011 deliveries; Hildebrandt, 7½ per cent; Schroeder, 34½ per cent for primiparæ, 9 per cent for multiparæ; Stevens, from Guy's Hospital, reports 133 lacerations in 562 cases, or 23.66 per cent. Of the 133, six only were multiparæ, 76 were slight, requiring one or two stitches. All lacerations over half an inch from the fourchette were counted. The text books give 35 per cent for primiparæ and 9 or 10 per cent for multiparæ. The fourchette is nicked in about 60 per cent of all primiparæ.

The elements involved in the production of lacerations are:

1. Disproportion between the head and the outlet.

2. Faulty position of the head, bringing it through in its long diameter.

3. Straight sacrum and poorly developed birth canal.

4. Narrow pubic arch.

5. Tough, inelastic vulvar ring.

6. Powerful contractions, forcing the head through before the structures have time to relax.

7. Unskilled use of obstetrical forceps.

8. Delay of the head on the perineum.

9. Administration of ergot.

In ten years of active obstetrical work the writer has used the following precautions to prevent rupture:

All primiparæ and most multiparæ are placed in the left lateral position as soon as the presenting part reaches the pelvic floor, or begins to strain on the perineum.

Chloroform is administered at the same time to check violent efforts at expulsion. If the contractions are gentle, it is withheld. Ether is not rapid enough to be quite as useful. It must be given in larger quantities and for a longer time to give results.

Direct pressure applied to the head when it appears at the vulva —by the left hand slipped between the patient's thighs, which are held apart by an assistant or by a pillow rolled and placed between the knees. The head is held back firmly, yet permitting a slight advance at each contraction, and at the same time regulating flexion and extension somewhat. Hohl's position of the thumb and fingers is a good one and can be used with the patient on the side.

Pressure applied to the jaw and lower part of the child's face by the fingers of the right hand as taught by Ritgen—pressure being made through the posterior portion of the perineum back near the coccyx and directed upward and forward—carries the whole head snugly under the pubic arch and keeps the degree of extension or flexion just as desired to direct the occiput safely through the outlet, and allow the nape of the neck to lie under the pubis before the sinciput passes the perineum, which insures engagement of the sub-occipito-bregmatic diameter in the diameter of the outlet, not the occipito-frontal, which is much longer and apt to present when the above manipulations are not applied correctly.

The rectum has been used by the writer at times for this maneuver, but owing to the dangers of infection one must hesitate before getting the thumb and fingers contaminated in this way. A bit of cotton wrapped round the fingers, wet in antiseptic solution, can easily be discarded when they are removed, or loose-fitting rubber

cots that can be slipped off by an assistant are something of a safeguard. However, the object of rectal expression can be gained almost as well by Ritgen's method, and it has the advantage of superior cleanliness. A thick pledget of cotton is placed lightly over the anal opening to gather any discharges, and frequently changed between contractions. The patient is allowed to cry out at the final expulsive efforts, and the exit of the head is accomplished between the pains rather than at the height of one.

Experience is required to be able to judge when to safely let the head pass. The extent of dilatation must be estimated, the fragile state of the perineal structures watched with a good light, and the head made to recede when the circulation in the same seems to be too much impeded. The head is lifted out with a slight rotary motion in order to turn the nose and chin slightly away from the median line of the perineum, and directed always in the arc of the circle of Carus. The shoulders following are given equal attention, the body being lifted upward and the rotary motion assisted. The upper shoulder is allowed to come down and out first if possible. As the head is about to emerge, the assistant separates the thighs more widely and the patient is rolled slightly toward the back, but not upon it.

There was a time when I did episiotomies occasionally, but I find as I practice more and more carefully the above measures the need of the maneuver seems to pass away, till in the last five hundred and fourteen cases occurring in my out-clinic, neither my assistants nor myself have performed it once.

REPORT OF CASES.

The following eighteen cases of rupture occurred in the last five hundred and fourteen cases confined in my obstetrical out-clinic carried on for the benefit of the students of Rush Medical College, in which I have been ably assisted by Drs. Elizabeth P. Hay and Julia D. Merrill:

1. L. P——, young primipara, delivered precipitately before the arrival of attendant. Two stitches.

2. B. O'B——, multipara. Perineum seat of scar from repair of former laceration. Student delivered under supervision. Two stitches.

3. R. L——, young primipara. Precipitate delivery before arrival of attendants. Four stitches.

4. O. H——, young primipara. Delivered before attendant reached bedside. Four stitches.

5. L. R——, multipara. Normal delivery. One stitch.

6. E. F——, multipara. Precipitate delivery before arrival of attendant. Three stitches.

7. M. C——, multipara. Normal delivery. Two stitches.

8. F. McC——, multipara. Student delivered under supervision. Three stitches.

9. G. B——, young primipara. Delivered by assistant. Four stitches.

10. P——, multipara. Precipitate birth. One stitch.

11. M. B——, young primipara. Student delivered under supervision. Two stitches.

12. M. H——, II-para. Delivered by assistant. Two stitches.

13. E. W——, young primipara. Delivered by assistant. Two stitches.

14. K. M——, young primipara. Precipitate birth. Three stitches.

15. M. C——, II-para. Perineum the seat of scar from flap operation for repair of perineum ten months before labor. Large head. Forceps. Three stitches.

16. M. B——, young primipara. Precipitate birth before arrival of attendant. Two stitches.

17. H. S——, young primipara. Precipitate birth in hands of student before arrival of assistant. Two stitches.

18. R. D——, II-para. Perineum the seat of scar from repair of former laceration. Student delivered under supervision. Three stitches.

Of the eighteen cases, nine were multiparæ. Such a preponderance was probably due to the fact that students were more often permitted to direct the head out in those cases than in primiparæ, and to the fact that three had former repairs, leaving scar tissue for the head to overcome.

Of the primiparæ, six were delivered before we could offer assistance. No severe ruptures occurred—no complete lacerations have ever taken place in the clinic at any time. All ruptures of one-half inch or more are repaired. Ten out of the eighteen had but one or two stitches, and the most severe required but four.

The perineum is closely inspected after the third stage, and the integrity of the perineal floor noted. The blood is sponged away and a strong light thrown on the parts to discover any trauma if present. Repair is done at once with silkworm-gut, and the parts cleansed once or twice daily as thought necessary till the tenth day, when the stitches are removed.

These cases are in the care of the visiting nurses who are in training with me. They are sent from case to case with antiseptic pads and proper equipment for giving external douches of bichloride of mercury solution 1 to 2000. The cases are not catheterized, and the bowels are made to move on the morning of the third day, and every second day thereafter.

There is union by first intention in a large proportion of the cases, which may seem almost incredible when we stop to consider that these cases are in the poorest homes in some of the worst quarters of our city, and are left to the care of their neighbors and relatives through the greater part of the day.

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100 STATE STREET.

PATHOGENESIS AND SURGICAL TREATMENT OF EXOPHTHALMIC GOITRE.*

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The history of exophthalmic goitre dates from the report of a case by Barry[1] in 1786. No complete study of it is found in the literature until Basedow[2] in 1840 presented a thesis upon the subject, in which he described its most characteristic symptom. From this time the disease has been known, particularly in Germany, by the name of Basedow's disease. Previous to Basedow's description of the cardinal symptoms which are now recognized as the principal features of the disease, Graves,[3] in 1835, in England, described what he termed "cardio-thymoid exophthalmus," but did not depict a typical case of primary exophthalmic goitre. In England, up to the present time, the disease has been known as Graves's disease. Basedow's observations had led him to regard the disease as due to chlorosis. Later studies made by von Grafe,[4] Köber[5] and Charcot[6] directed attention to the derangement of the sympathetic as the probable cause of the symptoms.

In the recognition of what we consider the characteristic symptoms of this disease credit belongs to a number of clinicians. Charcot[6] first observed the fine tremor so often seen; Tessier[7] the elevation of temperature; Chrosteks[8] the diminution of electrical resistance of the skin; von Grafe[4] the failure of the upper lid to follow the eyeball in lowering of the plane of vision. Lastly, it was mentioned that Möbius,[9] in 1883, first directed attention to the lessened power of convergence in persons suffering from this disease. He was also the first to advance the theory that the disease was due to a change in the secretion of the thyroid gtand.

In the study of the pathologic anatomy of exophthalmic goitre we are handicapped by the comparatively few post-mortem records. Early observers, among whom we may mention Müller,[10] White,[11] and Martin,[12] confined their studies chiefly to the condition of the nervous system and particularly to the medulla and the cervical sympathetic. In the medulla no changes of importance were found, although petechial hemorrhages were observed in the cord. These hemorrhages were recent and evidently occurred at the time of death, and therefore could bear no causal relation to the symptoms

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that were of long duration. The only observer who found positive evidence of disease in the medulla was Mendel.[13] He found, in one case, the left restiform body atrophic, with degenerative changes in the solitary bundles of the opposite side. As no one else has since found anything abnormal in the restiform bodies in exophthalmic goitre, and as a similar atrophy has been found by Oppenheim[14] where no symptoms of exophthalmic goitre existed during life, it is probable that there exists no relation between the findings of Mendel and the disease under consideration.

The greatest effort has been made to establish a relation between the exophthalmic goitre and lesions of the sympathetic. Virchow, Trousseau, and von Recklinghausen and others, have found atrophy of the nerve elements with increase in connective tissue of the cervical sympathetic, particularly in those fibers that supply the heart. This so-called sympathetic atrophy is frequently found post mortem. Furthermore, the histologic structure of the sympathetic ganglion varies much, even in the same subject, one ganglion showing all the signs of atrophy with pigmentation which is considered pathologic, while others may be normal. These changes in the ganglion may be found in subjects that never presented any symptoms during life that would indicate disease of the ganglion. Similar degenerative changes in the pneumogastric nerves have been considered the cause of exophthalmic goitre. As in the sympathetic, it has been found that degenerative changes are common in the pneumogastric and bear no relation to this disease.

The chief pathologic changes in exophthalmic goitre are to be found in the thyroid gland. In the true primary disease the findings are characteristic. Nearly all the tumors correspond to what we clinically recognize as diffuse hypertrophy of the gland, with an increase in the vascular supply. In most cases the gland is not greatly enlarged, its consistence is fairly firm, and on section moderate parenchymatous hypertrophy with diminution of the colloid material, or absence of the normal colloid contained in the follicles. There is usually proliferation of the epithelium of the gland, which in its growth may develop into papillary excrescences, having within epithelial lined tubes of various calibers. The follicles are at times filled with epithelium and the products of epithelium degeneration, or in some cases they may be empty. In old cases the connective tissue may be found increased in quantity, giving the appearance of a fibrous goitre. In but few are the vessels in the microscopic section found to be increased in size or number. Although the pathogenic changes just described, and which cor-

respond closely in most respects with those found in diffuse hypertrophy of the gland, are considered by von Eiselsberge[15] and others as constant and pathognomonic of exophthalmic goitre, yet any anatomical form of goitre may be associated with exophthalmus, tachycardia, or tremor, the cardinal symptoms, when they occur in the same individual, of what we recognize as exophthalmic goitre. Such cases are best classified as secondary exophthalmic goitre, and are atypical, frequently lacking one or more of the characteristic symptoms of the disease.

In other organs, changes of a secondary character are found. Frequently the heart is dilated; there may be hypertrophy of the left ventricle; in many, fatty degeneration of the muscle and myocarditis are present. A constant finding is the widespread changes in the voluntary muscles throughout the body. In old cases, intramuscular lipomatosis and degeneration of the muscle cells is a nearly constant finding.

The degeneration which takes place in the muscles throughout the body, and which is probably the direct result of the action of a toxic substance upon them, explains practically all the symptoms of the disease. To these changes we can trace the origin of the tremor, the general emaciation, and the loss of converging power. A weakening of the pharyngeal and tongue muscles from the same cause will give the so-called bulbar symptoms which were formerly regarded as evidence of disease in the medulla. The phenomenon of Bryson — loss of inspiratory expansion of the muscles of the thorax—depends upon a degeneration of the muscles of inspiration; namely, the thoracic muscles and the diaphragm. Lastly, the exophthalmus may be explained by the weakening of the ocular muscles, that permits of over-distention of the vessels of the eye and causes the bulging forward of the organ. This over-distention is the direct result of the loss of support furnished by the muscles that normally control the eye and retain it in place. Frequently enlargement of the lymphatic glands is found throughout the body. This is often associated with a persistent thymus gland giving the anatomical findings that have been termed the status thymicus, or status lymphaticus. In the absence of any other known cause, it would seem reasonable to suggest a possible relation between a diseased condition of the thyroid gland and this lymphatic hypertrophy.

Etiology. — In our brief review of the pathologic anatomy of exophthalmic goitre, we have shown that most of the theories concerning the etiology of this disease cannot be substantiated by post

mortem findings. It is well established clinically that the disease is much more common in the female than in the male. Buschan[16] fixed the ratio at 4.6 to 1; Reynolds[17] at 48 to 1. The age varies between 16 and 40; it is rarely seen before puberty and seldom develops late in life. Heredity seems to influence its development in certain cases. Ostericher observed in a family of ten children, of which the mother was hysterical, eight with more or less pronounced symptoms of exophthalmic goitre. At times it seems to develop after a psychical shock, as for instance after great fright. In these cases there probably existed evidences of the disease which had passed unnoticed before the attention was attracted to them by the condition following the shock. Pregnancy and diseases of the female sexual organs seem to influence the development of the disease in certain cases. There are numerous instances on record where the disease apparently began during pregnancy or the puerperium.

Of these so-considered causes, we can say that at the most they are but factors, and probably are only indirectly of causal moment. It is well known that simple enlargements of the thyroid frequently first become noticeable after psychic excitation. That there exist relations between pregnancy and diseases of the female sexual organs and simple goitre is well known. We therefore must conclude that these are only factors in the etiology, each having its influence on the thyroid gland. A change in the secretion of this gland, from whatever cause, must be looked upon as the essential factor in the etiology of this disease. Based upon Charcot's theory of a neuropathic origin, many writers have attempted to show that in the cervical sympathetic are to be found the chief causes of the disease. Jonnesco[18] and his followers explained all the symptoms upon the theory of irritation of the secretory fibers of the thyroid gland, supplied from the cervical sympathetic. These are stimulated, and there follows a hypersecretion, which in turn produces toxic symptoms. Von Eiselsberge believes that the function of the thyroid is to secrete a substance which neutralizes certain toxic chemicals which are the result of animal metabolism. In exophthalmic goitre he believes that either there exists a hypersecretion, the excess of which is thrown into the circulation, or else the character of the secretion is changed so that it becomes toxic.

This toxic substance produces secondary changes in the various organs of the body, particularly in the muscular system, which explains symptoms characteristic of this disease. Jonnesco believes

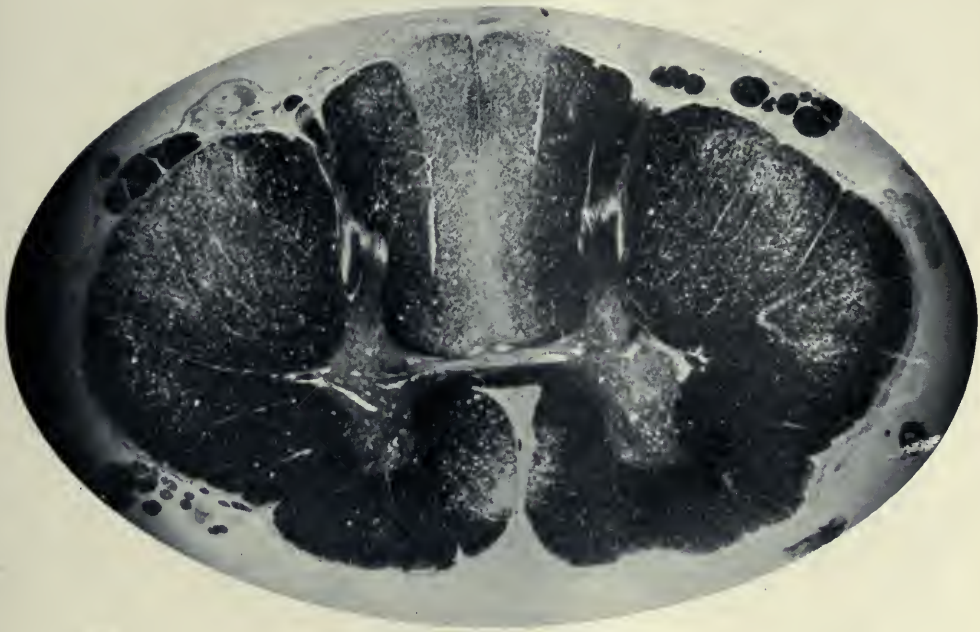

FIG. 1.—Cord, upper thoracic (for description see text). Weigert-Pal stain. Magnified nearly 6 diameters.

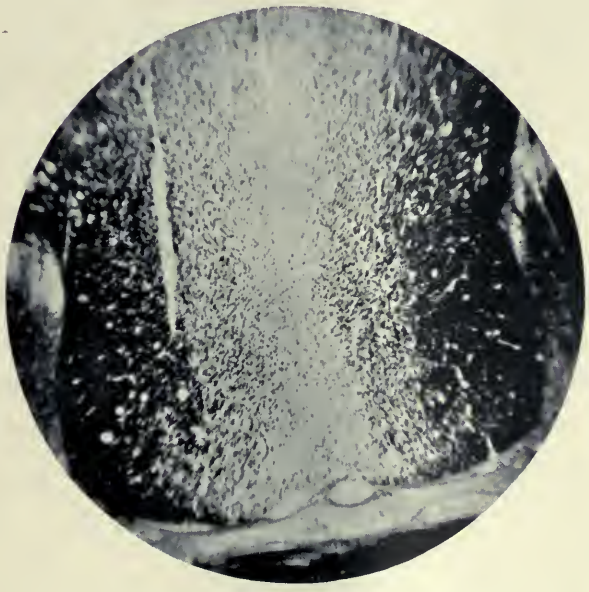

FIG. 2.—Cord, upper thoracic (same as Fig. 1; for description see text). Magnified 13.3 diameters.

FIG. 3.—Cord, upper thoracic (same as Fig. 1; for description see text). Magnified 13.3 diameters.

that the primary disease of the sympathetic not only explains the hypersecretion of the thyroid gland, which is the cause of the toxemia, but that it is the direct cause of the two most important manifestations of this disease, namely, the exophthalmus and the tachycardia. The exophthalmus he believes to be due to the stimulation of Müller's muscle, which is supplied by the sympathetic; and the tachycardia to irritation of the cardiac acceleratory fibers from the cervical sympathetic. As an evidence of the correctness of this view he directs attention to the rapid disappearance of these symptoms after the bilateral resection of the sympathetic.

A rational explanation of these symptoms, acceleration of the pulse and exophthalmus, is that they are the result of sympathetic irritation, but this is secondary to the disease of the thyroid and is a result of the action upon the secretory fibers of the sympathetic in the thyroid gland of its toxic secretion. The most convincing arguments in favor of the thyroid being the seat of the disease are:

1. The remarkable antithesis that seems to exist between the symptoms of exophthalmic goitre and those of struma-thyropriva where the functionating gland does not exist. Kocher, in 1883, was the first to show this antithesis. He further demonstrated that where there was a hypertrophy with increased vascularity of the gland, the conditions presupposing a hypersecretion, symptoms of thyroid intoxication were likely to develop.

2. The effect of struma operations. Here the improvement noted in the symptoms bears a direct relation to the amount of gland removed and the consequent diminution in its vascularity. A further argument in favor of the thyroid origin is the bad effect that follows the administration of thyroid preparations, and the increased number of cases that seem to result from the administration of iodin and its preparations in the treatment of goitre. The observations of Jouboulay,[20] who in cases of exothyropexy found that the secretion from an exophthalmic goitre was actually greater in quantity than in simple goitre, seems to favor the theory that the disease is due to hypersecretion of the thyroid gland. The severe symptoms of intoxication following exothyropexy, which give a mortality of 23.8 per cent to this operation, are also an evidence of the toxic properties to be found in the thyroid secretions in these cases.

Before considering the surgical treatment, it may be said that occasionally cases of exophthalmic goitre recover without any treatment. These, however, are exceedingly rare. Spontaneous cure of this disease probably results from degenerative changes in the

gland, or is due to the substitution of the fibrous form of goitre for the parenchymatous, this lessening or changing the secretion so that its toxic effect is modified or eliminated. For the medical treatment it may be said that it is always symptomatic, and never aims at the removal of the cause. From it only palliative results can be hoped for. It is exceptional to see all of the symptoms of the disease improve or disappear under the most persistent medical treatment. Frequently cases with tachycardia or extreme nervousness, and occasionally those with tremor, are benefited by internal medication.

Because of the exceedingly good results obtained in the operative treatment of exophthalmic goitre, it is our opinion that it is indicated in all cases where a fair trial of the medical treatment has been made, providing the patient has not been allowed to become so reduced as to preclude the possibility of withstanding the shock of operation. It is a well known fact that these cases do not bear any operation well. As a rule they are sent to the surgeon only as a last resort and at a time when the condition makes any operation extremely hazardous. There are cases, however, in which operative treatment is positively indicated. First, those where the goitre is large and causes marked pressure symptoms, especially when dyspnea is great, and asphyxiation is threatened. In the most extreme of these cases, no prolonged operation can be borne, and the surgeon can only give temporary relief by performing tracheotomy. Later, if the patient's condition will permit, removal of the goitre should be considered.

A second positive indication for the operative treatment is where the degree of exophthalmus is such that destruction of the eye from ulceration and infection is imminent. It should here be stated that operations on the gland frequently do not influence immediately the exophthalmus, and in not a few cases this condition does not improve after partial excision of the gland. For these cases of extreme exophthalmus, excision, preferably bilateral, of the cervical sympathetic after the method of Jonnesco seems to be the procedure that gives the most rapid and complete relief. As a rule, surgical treatment is more beneficial in cases of rapid development than in the more chronic form of exophthalmic goitre. This is especially true in acute cases following infectious diseases. Here, if the gland is removed before the system suffers from the effects of prolonged toxemia, with its resulting chain of degenerative changes, the best results are to be expected.

The size of the goitre, as a rule, should not influence for or

against operation. Small goitres many times are the cause of the most pronounced symptoms of intoxication. Excessive tachycardia, as a rule, is not an indication for operative treatment. The majority of cases in which this symptom is exaggerated are not able to stand a general anesthetic, and seldom survive any prolonged operation. In some of these cases operation under local anesthesia may be attempted.

The operative measures on the gland that have been employed in the treatment of exophthalmic goitre are practically the same as those for simple goitre. They are, first, ligation of one, two, or three of the thyroid arteries; second, exothyropexy; third, enucleation of nodular growths, particularly adenoma of the gland; fourth, partial or unilateral excision of the gland.

The chief exponent of ligation of the thyroid arteries is Mikulicz,[22] who in all cases ligates three of the vessels, claiming that no beneficial results are obtained when two are ligated. In one case where Kocher ligated all of the thyroid arteries, tetany developed immediately after the operation. Kopp[23] reports two deaths from tetany after ligation in one case of two and the second of three arteries. The argument advanced by Kocher and Mikulicz in favor of this operation is that it is less dangerous than partial excision, particularly when the goitre is extremely vascular. Against this procedure it may be stated that it is by no means a simple operation, especially when the goitre is large and the great vessels of the neck are dislocated by the tumor. Again, it is frequently followed by tetany, as evidenced by the experience of Kocher, Kopp, and Rehn,[24] and it is by no means certain in its results as regards a cure.

Exothyropexy, as practiced by Jaboulay, consists in freeing the gland from its environs and dislocating it upon the surface of the skin, where it is allowed to remain. As a result of atrophy and resorption, the gland gradually shrinks and becomes cicatrized. This operation has been practiced chiefly in France, and there by but a few surgeons. Following exothyropexy, symptoms of acute thyroid intoxication are frequently noted from the escape into the tissues of the secretion of the gland. An improvement in the most favorable cases is extremely slow. Excepting in France, this method of operating for any form of goitre has not been sanctioned by the profession.

Enucleation, although an operation of value in simple goitre, is seldom indicated in exophthalmic goitre. As previously stated, the anatomical form of goitre commonly met with in this disease

is the diffuse hypertrophy of the gland. Nodular growths, when found, are circumscribed hypertrophies rather than adenoma, and therefore are not easily enucleated. Von Eiselsberge considers the great vascularity of the capsule of the gland, which is common in exophthalmic goitre, as the chief element of danger in the cases where enucleation is attempted. Finally, the results as regards cure are not as good as when a part of the gland has been excised.

In by far the greatest number of cases, partial, usually unilateral, resection has been practiced in the surgical treatment of exophthalmic goitre. There is no doubt that the operation has dangers, but the ultimate results obtained are such as to justify the procedure when surgical treatment is to be advised. By this method a large portion of the secreting substance of the organ is removed, and the effect of eliminating from the system the toxic secretion of the part excised cannot fail to benefit the patient, providing the disease has not progressed so far that changes in the organs resulting from a prolonged toxemia are such that regeneration cannot be accomplished. The results, as will be shown later by review of a large number of cases subjected to operative treatment by various surgeons, justifies us in considering this the most rational means of treatment.

Besides the dangers incident to operation for simple goitres, we have in exophthalmic goitre certain conditions that may be developed during and after the operation that may cause a fatal termination. It is well known that patients suffering from this disease, especially those with pronounced tachycardia, bear general anesthesia of any kind badly. The degenerated heart muscle, with the increased irritability of the heart centers in these cases, greatly increases the chance of death in chloroform narcosis. In other cases where the goitre is large, or in the retro-sternal or retro-clavicular struma, the dangers from ether are equally great. In a few no general anesthetic should be given. In quite a number of cases the symptoms that were present before operation become greatly exaggerated immediately following it. The pulse increases in frequency and becomes arrhythmical, the exophthalmus becomes more pronounced, tremor and elevation of temperature rapidly increase. Great muscular weakness and delirium, with suppression of urine, are the symptoms which usually precede speedy dissolution. These symptoms are due to an escape into the tissues, and from there into the circulation, of a large quantity of toxic secretion of the gland. The already weakened nerve centers are simply overwhelmed and

the patient succumbs. It is rarely after an operation for exophthalmic goitre that we see a case run an apyretic course. Usually, for a while at least, the pulse is accelerated and the temperature elevated, even where no sepsis is present. Sudden deaths some hours or days after the operation may unexpectedly occur. These deaths are probably the result of general lymphatic and thymic hypertrophy, which is so often found in cases of exophthalmic goitre. It is now well known that sudden death, when no operation has been performed, is a possible termination of these cases of status lymphaticus. On post mortem nothing but degeneration of the heart muscle and general lymphatic hyperplasia is found.

Death from collapse of the trachea occurs after operation for any form of goitre. Fütterer has shown that in cases where a continued pressure by a tumor is made upon the trachea for some time, a mucoid degeneration of the cartilage with softening of the rings results. After a sudden inspiratory effort the weakened cartilages may collapse and death from asphyxia follow.

The rapidity with which evidence of improvement follows removal of the goitre varies greatly in different cases. There is usually first an improvement in the general condition of the patient, and then follows a change for the better in the nervous phenomena. Tachycardia is slow to improve, requiring months in many cases before actual relief is experienced. The exophthalmus is frequently last to disappear. In a few cases it is not influenced by the removal of the goitre.

In a recent paper of Sorgo[25] the results regarding the individual symptoms are tabulated. His table includes 172 cases. Of these, the tremor entirely disappeared in 57.9 per cent, the tachycardia in 48.7 per cent, and the exophthalmus in 48.2 per cent. The general condition of the patient was practically normal in 30 per cent of the cases. In about 25 per cent of the others there was great improvement in the symptoms, but the patients could not be said to be cured of any. The operation mortality in these cases is 13.9 per cent. The results as shown in the cases reviewed by von Eiselsberge, which include those reported by Mattisen,[26] Heydenreich,[27] Starr,[28] Schulz,[29] Buschan, Manheim,[30] and Sorgo, giving in all 1223 cases, show complete recovery in 44.8 per cent, and great improvement in 23 per cent. The mortality in these cases was 8.3 per cent.

Operations upon the cervical sympathetic for the relief of exophthalmic goitre may be considered under four heads:

1. Simple section of the sympathetic cord was first practiced by

Edmonds[31] in 1895. The next year Jouboulay performed the same operation, twice on one side and once on both sides, dividing the cord just below the superior ganglion.

2. Partial resection of the cervical sympathetic, first performed by Jouboulay, and later by Vignard and Quenu.[32] The latter removed the superior ganglion and the sympathetic cord for a distance of four centimeters on both sides.

3. Total bilateral resection, by which the three ganglia with the connecting nerves were entirely removed, was first practiced by Jouboulay.[21]

4. Stretching of the cervical sympathetic was proposed by Jouboulay and tried on one case; the operation was not successful. The tachycardia, which was the most troublesome symptom, was increased by it.

In detailing the results obtained by operations upon the cervical sympathetic, the stretching operation can be left out of consideration. The results of simple section of the sympathetic can be said to influence the exophthalmus and goitre but little, and to improve the tachycardia but slightly. Jouboulay reports six cases of unilateral and two of bilateral section of the cord. In these, the exophthalmus disappeared, the retraction of the eye being noticeable after the first day. The goitre was somewhat diminished in size, though the number of pulse beats per minute was not noticeably diminished; the heart, as a rule, became more regular in its action and the patient complained less of palpitation. One patient four years after operation could work twelve hours a day in a factory, while previous to operation she was bedridden.

The results as regards partial resection of the cervical sympathetic, including both unilateral and bilateral resections, are, on the whole, more favorable than those of simple section. Balascescu[33] reports twenty-seven carefully observed cases which were treated by partial resection. These cases had been watched for from one to four years. Of these, nine were cured and eleven greatly improved and two unimproved; there were five deaths, but none could be attributed to the operation. The same author reports seventeen cases of total bilateral resection of the sympathetic, fourteen of which were Jouboulay's. Of these, ten, or 58.9 per cent, recovered completely, the exophthalmus disappearing not later than the second day; improvement in the tachycardia was more gradual. In some cases, however, the pulse would immediately drop to normal and remain there. In two cases there was a recurrence of the heart symptoms after the pulse had been normal for some time. In five

of the seventeen cases one or more of the symptoms were greatly improved, although the patient could not be said to be cured.

The value of total bilateral resection Jouboulay considers as demonstrated in these cases, in which 58.9 per cent recovered and 29.4 per cent were greatly improved. There is no doubt that the results are as good as those obtained by unilateral thyroidectomy, although the number of cases is too small to definitely place the status of this operation.

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103 STATE STREET.

SUBACUTE COMBINED DEGENERATION OF THE SPINAL CORD WITH PERNICIOUS ANEMIA.[1]

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CLINICAL NOTES.

Lena W——, married, 51 years of age, was admitted to the Jefferson Hospital May 14, 1901.

Family history is negative. In her personal history there is a record of scarlatina at 15 years of age, rather severe, but with complete recovery. Five children are living and healthy.

About two years ago she noticed general weakness, more marked in the legs, with numbness and "crawling" sensation in the legs and feet; this grew progressively worse.

On admission to the hospital there was dyspnea, extreme weakness, pain in the back, and a sensation of a band about the waist; there were involuntary jerking movements of the legs, and pronounced difficulty in walking, so that she fell repeatedly. There seemed to be general visceral ptosis. Urinalysis revealed nothing of interest.

She was examined by Professor Dercum, who found the gait to be both spastic and ataxic, the knee-jerks exaggerated—the right more so than the left; the Babinski reflex pronounced on both sides, the tendon reactions in the arms plus, and all forms of sensation apparently preserved. He found also pretibial tenderness, disappearing ankle clonus, and nystagmus, quite marked laterally and slight vertically. The eyes were examined by Dr. de Schweinitz, who found both media clear; discs oval; arteries carrying very pallid blood; veins greatly distended and pressed upon by the somewhat rigid arteries; no recent hemorrhages, but evidence of previous hemorrhage.

A blood count made three days after admission revealed:

Erythrocytes	1,650,000
Leucocytes	5,400
Hemoglobin	38 per cent.
(Color-index	1.15)

There were large numbers of macrocytes and poikilocytes, a few microcytes, and one megaloblast.

[1] For the privilege of reporting this case I am indebted to Prof. H. A. Hare, into whose wards the patient was admitted, to Dr. Thomas G. Ashton, who had charge of the case, and to Prof. W. M. L. Coplin, through whom the cord came into my hands.

Differential count of leucocytes:

Polymorphonuclear	33 per cent.
Small lymphocytes	57 per cent.
Large lymphocytes	6.5 per cent.
Eosinophiles	3 per cent.

Epistaxis occurred on the 21st, one week after admission. A blood count made on that day revealed:

Erythrocytes	1,570,000
Leucocytes	7,800
Hemoglobin	34 per cent.
(Color index	1.08)

Numerous macrocytes, poikilocytes, four macroblasts, and one microblast were found.

Differential count of leucocytes:

Polymorphonuclear	49.5 per cent.
Large lymphocytes	3.5 per cent.
Small lymphocytes	46.5 per cent.
Eosinophiles	.5 per cent.

Ten days before death the patient was found, in the morning, to be completely paraplegic, and the bowels and bladder altogether incontinent, this aggravation of her symptoms having come on in the night. The state of sensation at this juncture and subsequently was not recorded.

For special reasons, only the thoracic and upper lumbar cord was obtainable at the autopsy; and this was put at once into Müller's fluid, no portion being reserved for treatment with special fixatives, although fair results were obtained later with the finer cell-stains in the hands of Professor Coplin. I relied chiefly upon the Weigert-Pal and Marchi methods, and most of the specimen was subjected to these two processes, as well as to those of general staining.

In cross section, after hardening in Müller's fluid, the cord presented, macroscopically, the appearance of "combined sclerosis," and in the Weigert-Pal preparations we see more clearly, on naked-eye inspection, the general picture of "posterolateral sclerosis" which Gowers indicated as the anatomic basis of his ataxic paraplegia.

Under the microscope, at the level of the second thoracic segment (Fig. 1), the Weigert-Pal preparation reveals almost complete disappearance of the medullary sheaths along the dorsomedian septum (Fig. 2) in two-thirds of its extent from the gray commissure, but a relative preservation of them along the dorsal third of the septum, the preserved area having the familiar shape of a flask with flaring mouth at the margin of the cord. Elsewhere in the columns

of Goll the degeneration is advanced, but less and less so as the columns of Burdach are approached.

The latter columns, by their comparatively normal state, contrast with the columns of Goll, and at each dorsolateral septum (which in this cord is clearly marked) between the two columns, the transition is even abrupt between the degenerated and the relatively healthy columns. In longitudinal sections the degenerated fibers show the characteristic beaded appearance of their myelin sheaths.

The dorsal root-zones are free of "sclerosis" but show a considerable number of empty spaces, which form a striking histologic feature appearing thus in an otherwise dark-stained field.

Lissauer's zone and the dorsal roots are normal.

The lateral columns are quite symmetrically degenerated. The affected zone on either side is of oval shape and is nearly confined to the crossed pyramidal tract, but reaches the surface of the cord in the midst of the direct cerebellar tract, which has thus lost a crescentic portion of its cross area. The direct cerebellar tract mainly, however, is uninvolved. The degeneration in the lateral column is nowhere so extreme as that in the columns of Goll, but empty spaces are a more marked feature, particularly at the periphery of the crossed pyramidal tract, and many of these empty spaces are found throughout the "lateral ground" area.

Ventrally there is an aggregation of empty spaces in the region of the direct pyramidal tracts, which are thus mapped out by a sieve appearance (Fig. 3). Dr. Coplin has pointed out in my sections the persistence of the supporting neuroglia in these vacuoles, as a dim network whose meshes correspond to nerve fibers which have disappeared.

Van Gieson's mixture and other general stains show an overgrowth of neuroglia which varies in density from the complete sclerosis of the middle zone (septal) of the dorsal region, to a slight trace of it on one side of the ventral sulcus. Sections treated with Weigert's neuroglia stain by Dr. Coplin reveal this feature very clearly.

Toluidin blue, Nissl's methylene blue, Delafield's hematoxylin, etc., fail to bring out any changes in the ganglion cells. The walls of blood-vessels are perhaps somewhat thickened, but the change is not confined to any region or tract of the cord. The central canal is somewhat dilated throughout.

At successively lower levels of the cord similar changes are found, the "combined degeneration" being as clearly marked at the lumbothoracic junction as at the second cervical segment; but

FIG. 4.—Cord, upper lumbar (for description see text). Technique and magnification same as Fig. 1.

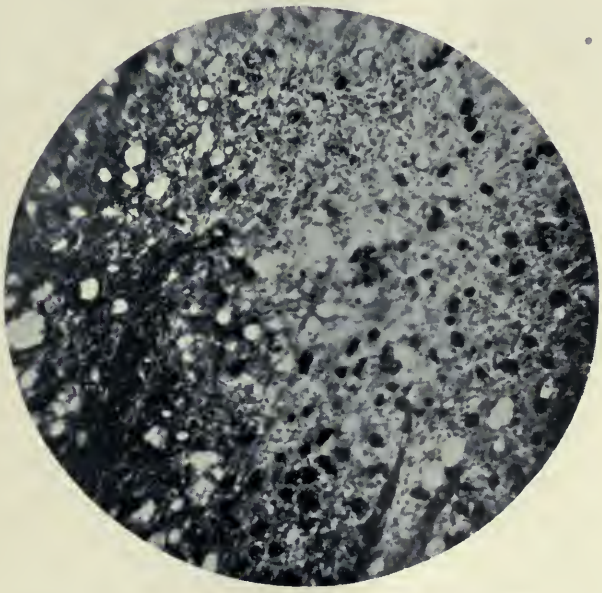


FIG. 5.—Cord, mid-thoracic (for description see text). Marchi method. Same magnification as Fig. 3.

there are two important differences with respect to the distribution of degenerated fibers in the lowermost sections (Fig. 4); (1) the sclerosis is somewhat evenly spread over the dorsal columns—not concentrated in the columns of Goll, nor more pronounced along the middle line, but extending through the column of Burdach, save for a narrow strip of the root-zone; (2) the crossed pyramidal tract is more sharply cut out by the lesion. Empty spaces in the areas near the crossed pyramidal tract, in the direct pyramidal tract, and in the root-zones are marked as at higher levels.

The columns of Clarke, wherever found, are well developed.

Marchi preparations from different levels show the black masses distributed rather widely, but far more abundantly in the dorsal columns and crossed pyramidal tracts than elsewhere. Where the sclerosis is most marked there the osmic stained masses are thickly sown (Fig. 5); and there is no separate zone of this broken-down myelin beyond the line of empty spaces, such as Russell, Batten and Collier, and Putnam and Taylor describe. In other words, from my preparations it would appear that degeneration, represented by (1) broken-down myelin (Marchi), and (2) neuroglia-sclerosis, has implicated the long tracts (pyramidal, Goll and Burdach), while that represented by empty spaces has spread irregularly but for the most part laterally. It is conceivable that this last process was the cause of the final complete paraplegia, as it probably is indicative of a process of very recent origin.

That some of the efferent fibres entering at the root-zone trend toward the middle line as they ascend the dorsal columns is well known; and hence that a sclerosis of these columns widespread in the lumbar cord should be concentrated along the dorsomedian septum at the cervicothoracic junction is a feature of tract degenerations, just as the growing sharpness of outline of the pyramidal tract degeneration from above downward belongs to system diseases. At any rate the process is partly systematic, so that the term "diffuse" applied to this subacute combined degeneration by Putnam and Taylor is not adequate for this case, as it is not for Case V of their own series, in my judgment. Some such term as *para*-systematic might be useful here.

Westphal described combined system disease of the spinal cord in 1879; Gowers's classic lecture on ataxic paraplegia appeared in 1885; and probably in the conception of each of these authorities were embraced cases like the present one. Before those years, and even later, it was customary for the Germans (Strümpell) to apply the term "tabes" to these cases of dorsolateral degeneration as well as to cases of tabes dorsalis. Accordingly when Leichtenstern

in 1884 described two cases of tabes (with increased knee-jerks) as running the course of pernicious anemia, he apparently hit upon the very type which is attracting attention to-day. Two years later Lichtheim studied the cord changes of pernicious anemia so thoroughly that subsequent workers have made comparatively little advance in the direct elucidation of the lesion, and to Lichtheim has been accorded the credit of priority. Many papers confirmatory of Lichtheim's findings have appeared; among the earliest being those of Putnam, Dana, Nonne, and Charles W. Burr.

The striking histologic features of the cord lesion—empty spaces in the white matter, and rather slight "sclerosis" in the degenerated areas—were described by Lichtheim; but while subsequent writers have found these features almost constant, some of these changes, notably empty spaces, have been discovered in early tabes dorsalis, and they probably represent a *subacute* phase of the ordinary parenchymatous degeneration of nerve tissue.

To Putnam and Taylor we owe a demonstration and a hypothesis. The demonstration is, that an unbroken series exists, both clinically and pathologically, from the cases of Lichtheim, Burr, etc., to cases of Gowers's ataxic paraplegia—pernicious anemia being associated with a few of them. The hypothesis is that in this entire series a toxemia, ranging in its manifestations from slight cachexia to pernicious anemia, is the causative factor.

The Italian Bastianelli, discerning independently these two series, (1) of spinal cord manifestations, (2) of blood manifestations, has imagined an inverse relationship between them which we might represent diagrammatically thus:

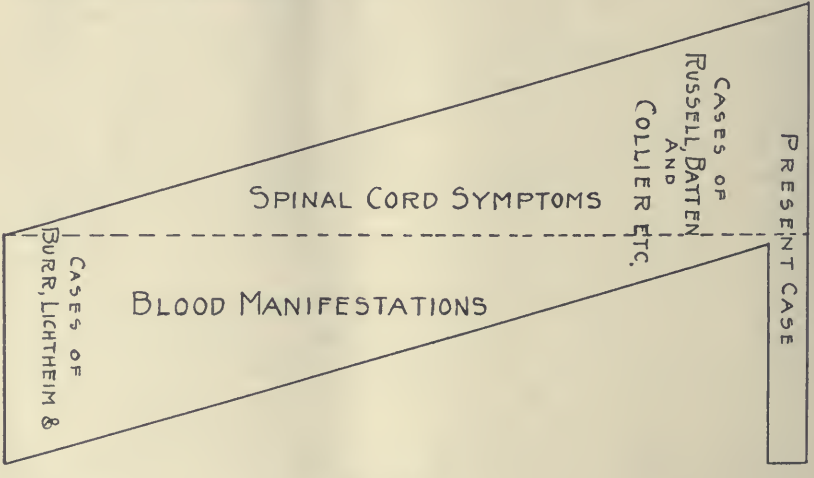

SPINAL CORD SYMPTOMS
BLOOD MANIFESTATIONS
CASES OF BURR, LICHTHEIM & OTHERS
CASES OF RUSSELL, BATTEN AND COLLIER ETC.
PRESENT CASE

DIAGRAM NO. 1.

Why there should be this inverse relationship is difficult to see; and in fact it does not hold for cases like the present one, in which the blood state and the cord symptoms are both extreme, nor for Case V of Putnam and Taylor's series, as pointed out by Taylor.

Russell, Batten, and Collier, in an authoritative paper, conceive of a relationship between the anemia and the cord symptoms which modifies our diagram to something like this:

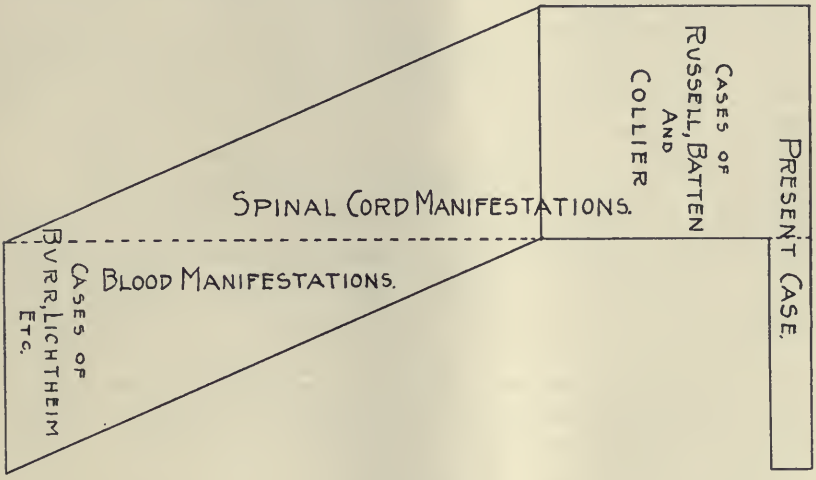


Diagram No. 2.

for they say, speaking of the cases with severe anemia, "in none of them have there been, either clinically or after death, the phenomena which characterize the class of case whose pathology we are now considering," and which these authors regard as a distinct nosological entity.

But here again our present case opposes itself to a rather premature generalization, for in its clinical course it allies itself with Russell's type, as it does with respect to the cord lesions found, though associated with pernicious anemia.

To support the hypothesis of a toxemic origin of this wide series of cases, Putnam and Taylor have marshalled an array of clinical data—diarrhea, constipation, "lack of vigor," various stigmata of degeneration, etc.—which are so common in the medical history of sick people generally that they are not convincing. Historically it would appear that the very origin of the toxemia theory was the discovery of the coincidence of severe anemia and cord degeneration, and we think such coincidence as in the present case is still the

strongest support for that theory. Deprived of this support, as it is seen to be in the conception of Russell, Batten and Collier, from the quotation above, "toxemia" becomes as vague and sterile as it is in some of its other uses, or as "degeneration" has become in psychiatry.

A suggestive observation was made by Nonne, and has been confirmed by a number of others, as to the mechanism of the peculiar cord degeneration in these cases. Hyaline degeneration and thickening of the walls of vessels, particularly of the capillaries, had been found by several observers in a considerable proportion of the cases, but Nonne, constructing out of his cases a series, graded from those in which cord changes were barely discernible to those showing the familiar wide-spread column degeneration, essayed to demonstrate that the slighter patchy degeneration in cases at the one end of his series was distributed around diseased vessels, presumably by the mechanism of a local anemia from diminished carrying power of these vessels; and assuming a homology between this *series of variations* of the cord lesion and a *series of stages* in individual cases, Nonne concludes that degeneration in all cases begins in patches corresponding to the *district of supply* of individual diseased vessels, that the more widespread areas in pronounced cases result from the coalescence of these patches, and that hence vascular disease is primarily concerned in the quasi-systematic cord diseases of pernicious anemia.

Whatever may be said of this process of reasoning, we may assume that such regional differences in the state of vessels, while more obvious in early cases, would still be apparent even in advanced stages of the cord disease, so that it is a question of fact to be investigated in every case that comes to hand. Russell, Batten, and Collier did find the diseased vessels in the degenerated areas only; but Spiller, in his report of a case (Hughes and Spiller), declares that the hyalin vessels were scattered and seemed to have no relation to degenerated areas; and the same is true of our case. Nonne regards such "negative" evidence as of slight import when weighed against his positive findings; but on the contrary we may suggest that if local vessel disease be the important factor, it must be always present, and since on the authority of Spiller and others it is to be declared inconstant, there must be another solution of the problem.

Indeed, in considering the sequence of changes according to Nonne's view—(1) toxemia, (2) discriminative vessel disease, (3) corresponding areas of degeneration—it appears *a priori* just as easy to explain why the last should be discriminative; and conversely,

just as difficult to account for the selection of certain vessels in the process as to account for the selection of the corresponding areas of the cord. In either case we are obliged to recur to the well-known doctrine of Marie, which accounts for the involvement of the dorsolateral white matter at all levels by postulating a less copious supply of blood in those sectors of the cord's circumference than in the ventrolateral sectors, these two portions being supplied by separate sets of vessels. Yet even here we are confronted with a paradox, pointed out by Russell, Batten and Collier, in that the cervical and upper thoracic regions of the cord, which are the favorite seat of this degeneration, are in truth more abundantly supplied with blood than the lower levels, which are commonly only slightly involved in the disease.

However, by any simple theory of ischemia, or of local toxemia, we might expect to find the degeneration more *sector-like* than we do in most cases; in all cases there is some approach to the system picture of degeneration. As Spiller has expressed it "they appear to the naked eye to be system degenerations." Some time ago in attempting to demonstrate the comma fields of Schultze, the oval field of Flechsig, etc., in a cord from a typical case of tabes dorsalis secured at the Philadelphia Hospital for teaching purposes, I was disappointed to find these so-called endogenous tracts completely degenerated and indistinguishable. This is not unusual, and I mention it merely for the suggestion it contains, that we must not be too stringent in our requirements of what shall constitute a system disease, lest we put the whole subject into confusion.

That seems, therefore, a wise conclusion reached by Putnam in 1891, but later abandoned by him, and newly insisted upon by Russell, that in these cases of subacute combined degeneration of the cord we have to do with two processes, one systematic, the other diffuse.

The present case is recorded for the support it lends to that conclusion; and as a slight rebuttal of the view that the subacute combined degeneration of Russell, Batten and Collier is never associated with pernicious anemia.

BOOK REVIEWS.

QUAIN'S DICTIONARY OF MEDICINE. By Various Writers. Third Edition. Edited by H. M. Murray, Assisted by John Harold and W. C. Bosanquet. New York: D. Appleton & Co. 1902.

This work of 1892 pages follows the general scheme laid down by Sir Richard Quain. As the title indicates, it is a dictionary, but it is at the same time an encyclopedia, and is intended as a work of reference for students and practitioners of medicine. In his preface the editor says that some departure from the original plan has been deemed advisable, and repetitions have, so far as possible, been excluded. It has been found practicable to include a large number of new articles, to rewrite many others, and yet to publish the dictionary in a single volume. The incursion of surgery into the realm of medicine has received due recognition, and more space has been allotted to these subjects.

The work is replete with cross-references, which adds materially to its value. The individual definitions, or what would better be termed articles, deal with the subject as a whole. Insanity includes an article of twenty-three pages. It deals with the causes, types, and treatment of mental disease. While the article does not rise to the dignity of a treatise, it contains an outline of the subject. The chief value which the volume will have for the mature practitioner is not in the description of the disorders which are commonly described in the text-books, but from the complete definitions of many words and the description of topics that fall between the grand divisions of the medical sciences as treated in the literature. For example, arcus senilis is described in detail; the underlying pathological change is given, together with a brief outline of its relations to senility. We could mention many hundreds of similar articles which contain information which it would be difficult to find elsewhere.

A MANUAL OF INSTRUCTION IN THE PRINCIPLES OF PROMPT AID TO THE INJURED. By Alvah H. Doty, M.D. Fourth Edition, Revised and Enlarged. New York: D. Appleton & Co. 1902.

This work has been before the profession for some years, and as its title implies it is a manual especially for the instruction of the hospital corps and ambulance service. It is useful for both civil and military practice.

The first seven chapters are taken up with the description of the normal structures of the body, together with a brief outline of their anatomical arrangement. Only so much is given as suffices for the proper comprehension of what follows. Chapter VIII deals with bandages, their application, and the method of controlling hemorrhage by pressure. There is a chapter on disinfection. The temporary dressings in the treatment of fracture, the use of the skirt of a coat for a sling for the arm, an umbrella for splinting the leg, and other devices, are figured. The methods of Hall, Howard, and Sylvester in resuscitating the drowned are described. It would have been better if Sylvester's method alone had been mentioned, as it is the most valuable, and too many methods are only confusing. The drill of the United States Hospital Corps is described.

LEADING ARTICLES.

THE GRAPE CURE.

References to the grape are found in the early history of medicine, but it is not until the seventeenth century that one notes in the German writings an employment of the grape systematically in the treatment of disease. It was not until the middle of the last century that places began to be spoken of in which the cure could be carried out. Since then numberless places in Austria, Germany, Hungary, and Switzerland have gained a reputation for their grape cure. Those in greatest repute are Durkheim, Gleisweiler, Bingen, Meran, Vevay, and Veytoux. These places are visited by large numbers annually for the purpose of taking the cure. It is remarkable that in France, where the grape has been cultivated with such success, there is no station that has achieved signal distinction.

The grape that is esteemed highest is the "Chasselas," of which there are numerous varieties. It is of agreeable taste and easy digestion. It is comparatively rare that black grapes are used in the cure, but if used preference is given to the "Petit-Noir" and the "Morrillon." The "Gutedel" is a grape closely resembling the Chasselas, and is much prized in Durkheim. The "Kleinberger" is a similar grape; large, with a transparent, fine skin containing much juice. It is less sweet than the preceding species and has certain laxative properties. All of the grapes contain the same elements, but the proportions vary in the different varieties within certain limits, depending upon the nature of the soil. Some contain more sugar, others are astringent, and others more watery. Some are rich in alkaline salts, which determine some difference in the therapeutic action.

Grapes are composed of three parts, pulp, skin, and seeds; the pulp representing from 87 to 89 parts in the 100 of the total weight of the grape, the skin 7 to 8 parts, and the seeds 4 to 5 parts. The pulp is the essential part of the cure. It contains from 72 to 80 parts of water, 10 to 20 parts of sugar, 0.5 parts of acid tartrate of potassium, and 0.3 to 0.5 of free acid, either tartaric or malic. In each 100 parts there is from 1.2 to 1.5 parts of albuminoids. In addition to the potassium, which is in considerable amount, there is found calcium, magnesium, the oxides of iron and manganese, a trace of silica and aluminum, combined with phosphoric,

sulphuric, and nitric acids. The skin contains the greatest quantity of cream of tartar and mineral materials, and in addition a certain amount of tannin, about 1.5 parts in 100. A greater portion of tannin is found in the black than in the white grapes. In the seeds there is a large proportion of tannin and mineral matter, mostly phosphate of lime combined with woody fiber. In addition there is a green oil which has purgative properties. It is not thought that the laxative effect of the grape cure is due to this substance, but rather to the mechanical action of the seeds, as they undergo no digestion in the intestinal tube. The juice of the grape, it will be noted, contains salines in large quantity, which constitute a veritable natural mineral water. In cases of gout, and in diseases of the kidney, it is not infrequently recommended that the grape cure be taken after a season at the mineral springs. The physiological action of the grape cure is somewhat similar to that of the milk cure.

In the application of the grape cure, preference should be given to the white grape; they should be ripe, the skin fine and the pulp clear. Grapes that are still hard have a markedly laxative property and frequently cause irritation of the mucous membrane of the mouth. In some cases in which there is difficulty in eating the grapes, the juice is expressed and taken in a fresh state. The quantity taken by a patient varies from one-half kilogram to three or four kilograms. It is well to begin with the former quantity, about one pound, and progressively increase the amount; the larger quantities are reached in about two weeks. The duration of the cure varies from three to six weeks.

The skin of the grape is rejected, and, so far as possible, the seeds. The greater quantity of grapes are taken early in the morning. If large quantities are used, the grapes are consumed about an hour after the regular meals. The cure is favored by exercise in the open air, which improves the digestion, respiration, and the combustion of the hydrocarbons in the grape.

The food during the cure should be regulated in reference to the effect which it is desired to secure. It is to be remembered that the grapes are a medicine, but they are at the same time nutritive. With the use of the watery white grapes, it is necessary to employ a more substantial diet, as the free purgation carries off most of the proteids of the grape. As the grape is rich in hydrocarbons, it is not necessary that they be present in any quantity in the diet, and fats may be omitted. Grilled or roasted meats and lean fish are permitted.

There is commonly observed during the grape medication a general improvement in the health; the appetite augments, the digestion improves, and there is an increase of weight and a general feeling of well being. The grape cure is employed in disorders of the digestive tract, engorgements of the abdominal viscera, hypertrophies of the liver and spleen, ascites, jaundice, gall-stones, and in chronic acute disorders, as well as habitual constipation. It is especially useful in neurasthenia accompanied by constipation, and in certain maladies of the respiratory organs and circulation. In scrofula and in rheumatic cases it is useful, especially those in which alkaline laxatives and diuretics are indicated. It is not contraindicated in the very fleshy.

We are surprised that the grape cure has not received greater attention in the United States. There are many localities in which a grape of superior excellence is available and a climate which leaves nothing to be desired. In Michigan, Ohio, California and many parts of New York and other equally accessible places, grapes are raised in abundance, and to these places patients could be sent who need an out-of-door life and the ingestion of large quantities of alkaline salts. Properly exploited, we feel sure that the grape cure would become as popular in this country as it is in Europe.

EDITORIAL COMMENT.

GENERAL LEONARD WOOD TO HAVE CHARGE OF THE PANAMA CANAL.

Rumor has it that Dr. Wood was tendered the supervision of the building of the Panama canal by the President, while on a visit to the latter at Oyster Bay. We are disposed to give credence to this rumor, particularly as it is an admirable appointment and one that is quite in line with the President's policy. While the naming of the Commission will not take place before next winter, it may be safely predicted that General Wood will be placed in charge of the work. The extraordinary record made by him in the administration of Cuban affairs will stand as one of the leading administrative achievements of an American. The fear that in the appointment of the governing body of the canal a politician under the guise of a statesman would be chosen, or possibly a lawyer, will be happily laid to rest by the appointment of Dr. Wood. It is a recognition of the value of a medical education as a preparation for such work. It is safe to say that it was the medical knowledge of Dr. Wood, combined with his rare executive ability, that enabled him to reach the signal success that he did in Cuba. Without a thorough knowledge of medicine it would have been impossible for him to appreciate and apply the rules of sanitary science that stamped his administration as unique.

We contend that a medical education peculiarly fits a man for an executive position, notwithstanding the contrary opinion that is held by the average layman. We can point with admiration to a large number of charitable institutions and hospitals throughout the United States that are under the sole charge of medical men, and we defy anyone to produce a like record on the part of any other profession or occupation. Take, for example, the administration of the hospitals for the insane alone, with their thousands of inmates, and the enormous sums of money that are expended under the direction of their superintendents. How rarely one hears of the failure of the officers doing their duty! These alone would demonstrate conclusively the value of a medical training for an executive position.

We do not attempt to define the term "executive ability;" in a general way we all understand what is meant. It is the capacity to manage affairs, to manage men, and to secure the coöperation of others in the advancement of an enterprise. Unfortunately, executive ability and great learning are not always associated, but

we presume that in all occupations there is about the same amount of executive ability. The question is then, how far will a special education and training fit a man for a particular position? It is a popular impression in this country that the legal profession is one that peculiarly fits one for the administration of public affairs. Undoubtedly it does, so far as the mere law-making function is concerned, but when we come to the executive position the training of the lawyer, the soldier, or the politician is not the best sort of training.

There will be peculiar difficulties attending the construction of the Panama canal. Aside from the wise handling of the funds and the proper forwarding of the work, there will be the knotty problem of the care of the health of a large number of individuals congregated in camps, in a climate which is peculiarly trying to the white man—in short, the conditions will all favor the development of epidemic diseases. If a severe epidemic once starts, and it certainly will unless extraordinary precautions are taken, it will seriously hamper the construction of the canal and enormously increase the expense. If a sanitarian of Dr. Wood's ability is appointed, it is the best precaution that can be taken against the most serious difficulty that confronts the construction of the canal.

THE TRENDELENBURG POSITION.

It has been said of medical discoveries that those which are new are not true, and those which are true have been made before. It is a fact that things are rediscovered after they have been forgotten. Laennec's classical treatise on cirrhosis of the liver is still enjoyed and quoted by critical students of medicine, though his discoveries had been noted three hundred years before this classic was written. One of the most remarkable additions to literature is the so-called Koplik spots in measles. They were extensively commented upon in the periodical press and were described in text-books as Koplik's spots. It remained for some one, a year or more after the exploiting of this discovery, to point out that they were described in a text-book upon medicine which was readily accessible.

F. Jayle, in *La Presse Médicale*, June 5, 1902, calls attention to the fact that a number of the ancient texts contain an account of the treatment or operation for hernia by inverting the patient. Two plates are given illustrating a hernia operation, one in which the patient is nearly reversed, though resting upon a board placed at an

acute angle. This plate was taken from Roland's work of the 13th century. A figure is given taken from Scultetus (Fig. 1), about 1630, who figures an operation for hernia in which the patient was placed upon a board and the head depressed at an angle of about thirty degrees, it being steadied by an assistant who at the same

FIG. 1.—The B operation for hernia. Scultetus, about 1630.

FIG. 2.—The Trendelenburg position in 1885.

time holds his hands over the eyes of the patient. Trendelenburg described the position now known by his name in 1885. Fig. 2 illustrates the manner in which it was carried out before mechanical appliances were devised for maintaining it.

AMERICAN INDIAN METHODS IN THE TREATMENT OF FRACTURES.

Attention has been directed of late to the value of massage in the treatment of fractures, some of the French surgeons going so far as to treat many cases with no retentive apparatus. In a recent article on "Indian Medicine," by Nelson W. Wilson (*Buffalo Medical Journal*, May, 1902), there is an excellent account of the manner in which the Indian medicine man treats a fracture with the aid of massage. The practitioner was one War Bonnet, who practiced among the delegates to the Indian Congress at the Pan-American Exposition. These Indians were in tepees, cooked their food over camp-fires, and in other respects lived much as they had outside the confines of civilization. In the article in question numerous examples are given of the effects of Indian medicine, one of the most interesting relating to the treatment of fractures.

Rocky Bear, a sub-chief, broke his leg and was sent to a city hospital. The following day he demanded to be returned to his tribe, and was brought back. That night the dressing was removed and War Bonnet was in attendance. Rocky Bear stated that he had much pain in the leg and had not slept, and that War Bonnet was going to take all the pain away and put him to sleep. The medicine man smeared his palms with grease and warmed them over a fire and then dipped his fingers into a bag containing a grayish powder, mixed it with the grease and then dipped his hand into some white powder. With this he rubbed the broken leg carefully, gently, all the while chanting a weird but not unmusical song. Occasionally he would change the powders. In ten or fifteen minutes Rocky Bear said his pain was gone. In a half hour he was drowsy and a short time after was asleep. Before leaving the tepee War Bonnet bound up the leg with a splint of thongs. Twice a day he treated Rocky Bear, and when the latter went back to the reservation he had a good leg. The splint was used continuously and War Bonnet set the leg in a perfect fashion. His explanation of the treatment was that the splints were to keep the bones together, and that he took them off and rubbed the leg to let the blood get through and to keep the leg alive, adding that if the splints were left on the leg would die.

While we cannot admire some of the practices of War Bonnet, as they savor too much of Christian Science, and we question whether his knowledge of pathology is sufficient to make him a learned and competent practitioner, yet we cannot but admire his methods of treating fractures. The use of a retentive apparatus that is removed

twice a day, with thorough massage of the affected limb, will give far better results than a continuous fixed dressing. The relief of pain is one of the important elements in it, and such a method of treatment recognizes that in the process of repair the nutrition of the part is of the highest importance.

INSANITY AND THE DEATH PENALTY.

The Lancet, in a recent editorial (June 21, 1902), refers to the recent trial of a man named Simmons, indicted for murder, as affording an example of the change that has taken place in the last fifty years in the attitude of the criminal law toward those mentally affected. There was no question of the commission of the crime, the accused person having gone into a public-house and shot his victim, who was a barmaid, in the presence of several witnesses. The history of the prisoner was traced with minuteness during childhood, youth, and early manhood. The facts were laid before two experts, with the result that the latter appeared in behalf of the prisoner and testified that at the time of the crime the accused was suffering from "minor epilepsy." After a brief consultation, the jury found that the accused committed the murder, but that he was insane. The presiding judge concurred in this decision and ordered the prisoner detained until His Majesty's pleasure should be known.

In commenting upon the above, *The Lancet* refers to the McNaughton case, in which the law was laid down by the House of Lords, who stated that the real test of insanity was a knowledge of right and wrong. In reference to delusion supplying the motive for a crime, it was to be considered in the same situation as to responsibility as if the facts to which the delusion related were real. The obvious deduction under such a ruling would be that a man might kill another under the delusion that he was defending his own life from a murderous assailant, but must not be so excused if he took life merely because he was under the delusion that his victim had done some great injury to his character.

Since the McNaughton case, while there has been a steady development of medical and psychological knowledge, there has been no distinct enunciation of the views of courts contrary to it. Advancing civilization in a milder age has modified the summing up of judges and the verdicts of juries. The result of this is that where it appears that a murderer acted under a delusion, or under an impulse which a reasonable man would have controlled, there

was an absence of self-control owing to mental infirmity. If there is trustworthy evidence of an unsoundness of mind upon which a jury may act, it is clearly merciful and just that the prisoner should receive the benefit of the doubt. In the opinion of *The Lancet* the ruling and practice of the criminal courts of England have departed widely from the decision in the McNaughton case. At the same time, the Supreme Courts in our own country are reaffirming the views of the House of Lords as adequate tests of mental incapacity. A recent article in reference to certain convictions in the State of Maine emphasizes the fact that there had never been an acquittal in that State upon the ground of insanity, though persons had been tried for capital offences who presented the most obvious mental defects.

Insane criminals and criminal lunatics form the most dangerous elements in a community; they are not amenable to moral suasion, or the usual restraints surrounding healthy minds. When placed upon trial, juries recognize the dangerous elements in these cases, and while they do not inflict the death penalty, they bring in a somewhat illogical verdict that the person is to be confined in the penitentiary for life. If, as a matter of fact, they believed that the person was not insane, the extreme penalty should be inflicted; if they did believe in insanity, acquittal was the only logical outcome. In Illinois acquittal on the ground of insanity carries with it a committal to the asylum at Chester. After a short detention there, if the individual is in possession of self-control, an application is made before the same judge for the discharge of the accused person under the habeas corpus act on the ground that he has recovered. The proceedings being entirely *ex parte*, usually result in favor of the criminal, and he is discharged as of sound mind. The effect of a life sentence in the penitentiary is to send such individuals to a place where they cannot escape through this loophole. If the individuals are found to be insane in the penitentiary, they can be transferred to the criminal lunatic asylum, where, if they recover, they must be returned to the penitentiary.

Substantially this same result is attained in England, where the term "detained until His Majesty's pleasure should be known," carries with it the incarceration in the criminal lunatic asylum in Broadmoor, similar in every respect to a life sentence in the penitentiary. There are discharges from this asylum; they are not based on *ex parte* proceedings in a court of law, but upon a study by experts of the mental and moral condition of the individual. The incorrigible insane criminal and the dangerous, deluded maniac are kept in restraint as long as they are a menace to the community.

LAWS PASSED BY THE FIFTY-SEVENTH CONGRESS OF MEDICAL INTEREST.

The oleo bill will long remain a monument to the cleverness of Congress in evading a constitutional provision. In the past efforts have been made to inhibit the sale of substitutes for butter. The first was a tax, which was not for the purpose of raising a revenue, but under this guise every package was stamped, betraying its contents. It was believed that if the substitutes for butter were sold under their proper names their popularity would be lessened. On the contrary, people found that the butter substitutes were palatable and nutritious. At first, while the name under which they had masqueraded was discontinued there may have been some falling off in the sale; this was ultimately regained, the people accepting these substances under their proper names. The present bill ostensibly aims at increasing the revenues and levies a tax of ten cents a pound upon oleo products that are colored in imitation of butter. This substance, if no artificial coloring is used, is nearly white, resembling lard. The purpose of the bill, of course, is not to raise revenue, but to distinguish the artificial substitutes for butter, which are commonly colored. This is to prevent restaurants and boarding-house keepers from palming off the substitutes for butter as the products of the dairy. The keepers of restaurants and hotels were, under the old system, able to buy their oleomargarine in original packages, but at the table there were no distinguishing marks to enable the guests to say whether it was butter or the spurious product. It is hoped by the bill to notify the consumer. Already there are suggestions as to possible evasions; one is to sell with each original package a proper amount of coloring matter, which is to be incorporated with the oleo before it is served. A more probable outcome of this legislation will be that the people will learn to eat uncolored oleomargarine, and as long as it is a good and wholesome product, easy of digestion, it will probably compete in its uncolored state with butter.

The value of this legislation from a public health standpoint is the hint that it gives of the desire of Congress to legislate upon questions pertaining to the public health. We have frequently called attention in these pages to the enormous strides which are being made in the vitiation of our food products. Their manufacture by large concerns makes most of them articles of interstate commerce and hence brings them under the jurisdiction of Congress. While the oleomargarine bill was leveled at fraud, it was one that did not really affect the public health, and the bill was passed

largely at the behest of an influential political faction. The harmful adulterants that destroy the food value of an article have not been approached by Congress. One of the great evils, the adulteration of alcoholic beverages which have upon them the government stamp, is one that should have long since been corrected. The oleo bill, while of little interest from a public health standpoint, may yet be of value in furnishing a precedent upon which pure food legislation may be based.

One of the most important bits of legislation was that relating to the Marine Hospital Service. Since this service was placed upon a permanent basis there has been an improvement in the personnel, and its work has been of growing importance. Its natural development may give us a public health department which will adequately deal with quarantine and the control of epidemic diseases, in so far as they fall under the charge of the general government.

The definite decision in favor of the Panama route for the canal brings up the question of the health conditions prevailing at Nicaragua and the isthmus. The recent volcanic eruptions in Martinique have caused some doubt of the availability of the Nicaragua route. This has suddenly shifted the public mind and Congress in favor of the Panama route. It is surprising how little authentic data there is upon the comparative health condition of the proposed routes. There were decimating epidemics during the years that the French company was engaged in the construction of the canal, and "Chagres" fever has an unenviable reputation in its mortality record. The question whether there may not be health conditions, particularly in the coast regions of Nicaragua, that are quite as deadly as those of Panama is not definitely known. More data is needed upon this all-important subject, for we feel that the health conditions prevailing in the two places are of even more importance than the question of volcanoes, or the distance which vessels will have to go in making the trip through the canal.

THE POSITION OF THE BODY FAVORING DIGESTION.

In a former issue of MEDICINE we have referred to a communication by a French writer who states that with the patient upon the right side there is a natural gravitation of the contents of the stomach into the pylorus, favoring the passage of food into the intestines. Such a position was held to be of service in the acute forms of indigestion, and the writer reports a number of cases in which passive stasis of the stomach contents was not relieved by

this simple procedure. Recently the subject has been studied by A. Ogarkow (F. v. Maring, *Archiv für Klinische Medicin*, 1901, Bd. lxxi), who has determined experimentally that the stomach empties itself most rapidly when the individual is lying upon the right side, and also when he is walking rapidly. When standing, sitting, lying on the left side, or walking slowly, the conditions are less favorable for the rapid emptying of the organ. When lying upon the back or face, the conditions are less favorable than when upon the right side, but somewhat more so than in a standing position. Recently Link (*Die Therapie der Gegenwart*, May, 1902) has examined the subject and comes to the same conclusions. Link is of the opinion that it is important in certain pathological changes in the stomach to have the patient keep a position upon the right side for a considerable time after taking food. It is stated that this simple procedure is of considerable therapeutic value.

LUMBAR PUNCTURE IN SEVERE NERVOUS DISEASES.

Notwithstanding the brilliant results achieved by Quincke in the diagnosis of nervous disorders by lumbar puncture, the method has not been applied as frequently as it deserves. In diagnosis results have been brilliant, but in the matter of treatment much less satisfactory results have been achieved, some even going so far as to claim that lumbar puncture has no place in the treatment of disease. Such a view is not warranted by an examination of the literature. Most cases of cerebral pressure will be benefited by lumbar puncture. Conditions which favor the lowering of intracranial pressure by the withdrawal of the fluid are not yet well understood. In some pathologic processes the cranium seems to be shut off from the spinal canal, and hence there is no relief of pressure. In others there is a distinct improvement, so that the variety of cases in which lumbar puncture has been of benefit is remarkable, but they are generally characterized by an increase in the cerebrospinal fluid, its withdrawal producing a symptomatic improvement. The effects now attained are sufficient to justify one in resorting to this procedure in almost any case in which the cerebral symptoms are sufficiently marked to suggest the idea of an increase in intracranial pressure due to an acute process. In the chronic conditions in which pain is a marked element, such as cerebral tumor, the withdrawal of a considerable amount of cerebral fluid is sometimes found to give marked relief from the pain.

ABSTRACTS.

MEDICINE.

Cardiac Arrhythmia.— ALLBUTT, CLIFFORD. *The Medical Chronicle*, Fourth Series, vol. ii, No. 5, p. 321, February, 1902.

The normal rhythm of the heart approaches so nearly to perfect regularity that it may be regarded as practically equable. Even the alterations produced in it by respiration are imperceptible except in abnormal states of the system or heart. In a heart in which the rhythm is pronounced good the time rate should be equable and also the force and volume of the pulses.

The rate is the most important; the volume is nearly always in accordance with it, quick contractions meaning as a rule less output per beat, and conversely. If the arterial diameters remain constant, rate and volume will usually vary together. In discussing the disorders of rhythm we should carefully analyze the irregularities of rate, as this is the dominant feature.

Disorders of rate may be regarded as intermittence, grouped beats, continuous inequality, phases of excessive speed, and phases of infrequency.

To understand intermittence it is necessary to consider certain inherent properties of the heart muscle. The cardiac muscle has periods of resistance to stimulus which correspond to the period of rest of the heart muscle. From this moment, however, the resistance to a renewed stimulus diminishes. If before the normal or physiological stimulus coincidental to the function of the heart some abnormal stimulus intrudes, the cardiac muscle will contract before its due time. It is obvious that as this intercurrence comes in before the muscle has recovered its full charge of refreshment this premature contraction will be a short one, its length depending upon the time that has elapsed since the termination of systole.

On the moment of the up-stroke of the sphygmograph we assume the heart to be in a refractory state, but the onset of an untimely stimulant resisted at the supreme moment will bring a response sooner or later, and the sooner the more irritable the muscle or the more potent the stimulant. The earlier this reaction the shallower must be notch in the descending limb of the sphygmograph curve. Contraction is followed by a refractory period in the premature, just as in a normal beat. The descending curve of the sphygmogram

must begin not from the original or proper top, but from the secondary or intrusive peak; and as regards its duration, if there be no renewal of the foreign stimulus, the muscle taking its rest from the secondary peak would at the end of this rest have to wait the next recurrence but one of the normal series of stimuli; for the very next it would be apt to miss during the refractory period pertaining to the extra contraction. If the next normal stimulus came when the heart was irregularly engaged the beats should be nearly twice as long as the normal.

This is what happens clinically in ordinary intermittence, first felt at the wrist, where the extra wave does not usually arrive. During this long rest the ventricles have had time to fill more largely and the next beat is consequently a bigger one. Clinically we observe a normal beat which is followed by a shallow one at too short an interval; next there is a pause of about twice the normal length and then a big beat occurs, a beat that may be so strong as to be observed by the patient.

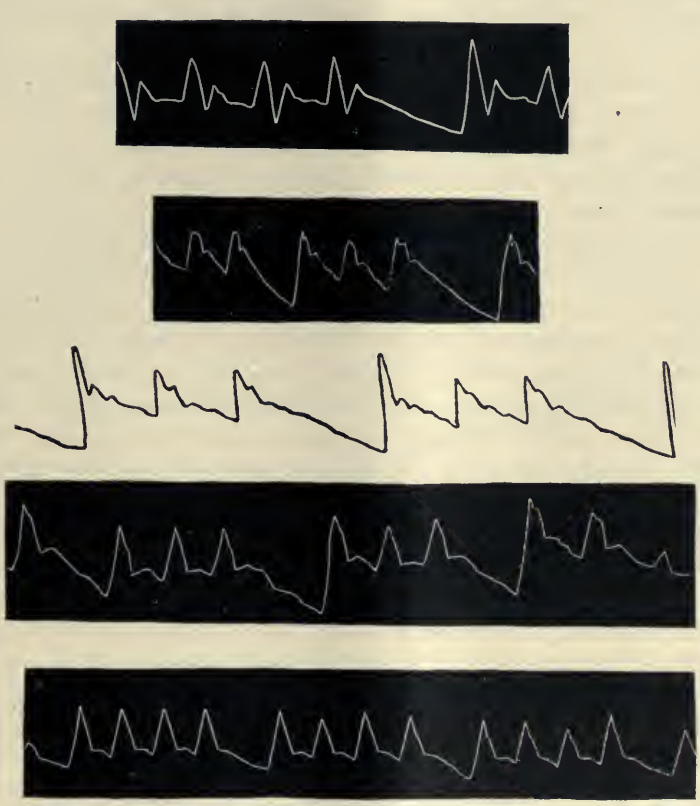
The above explanation presupposes an adventitious stimulus that is not continuous nor rapidly repeated, and that the intermittence, if it recurs, does not until the proper rhythm has been reëstablished for a time. If the foreign stimulus is practically persistent, as soon as the refractory period pertaining to the adventitious beat, or "extra-systole," is passing away the untimely pricking of the foreign stimulus will, if acute enough, call forth another premature and shallow beat, and this succession of incomplete systoles may go on with a false regularity for some little time, say four or five beats, but not indefinitely, because under such incessant importunity the muscle will tire, its reluctance will be less and less easily overcome, and the heart will compass the double rest, after which there may be another such series.

Perturbations of this kind may group themselves so that we have an ordinary systole followed by an "extra-systole," that is to say, an ordinary intermittence; or if in the curve of descent the extra-systole fall a little later, a full beat followed by one smaller, but perceptible at the wrist—the "pulsus alterans;" or if a little later still, the "pulsus bigeminus" (which is essentially the same thing); or if the extra-systoles are multiplied, a "trigeminus," or even a "quadrigeminus;" and so forth.

Now any of these casualties, and it is obvious that there may be many permutations of them, may occur in a heart which is but functionally disordered. Many poisons are capable of this kind of action on the cardiac muscle; the salicylates produce it in many

persons; digitalis has a well-known tendency to produce a twin or triple pulse; tobacco and coffee may cause intermittence, or the grouped beats, as well as the less orderly disorders of rhythm.

In some or many of these cases it may be very difficult to distinguish between irritation of the vagus with consequent inhibition of the heart, and direct action on the muscle itself. For intermittence or other halting of the pulse may be due to defect of conduction in the muscle; the consequence, it may be, of some toxic agent, or of



some intrinsic degeneration. The strip of muscle called "Gaskell's bridge"—that which unites auricles and ventricles and serves as the path of conduction of the stimulus of muscular contraction between these chambers—is at best a slender one; this we ascertain not only by anatomical observation, but also by measure of the not inconsiderable interval which in the mammalian heart is occupied by the traveling of the stimulus from the auricles to the ventricles. In

case of degeneration of the cardiac muscle, this bridge may become so frail that the interval between auricular and ventricular contraction is abnormally prolonged, or even that, time after time, it may not be transmitted at all; thus the auricular beat may occur alone and be imperceptible unless perhaps by means of the sphygmograph. For instance, in elderly persons under stress of pulmonary disease, intermittence may be due to vagus constraint, interposed to save a weary heart, which is grave enough; or it may be due to a rickety state of this bridge, as a part of a more general deterioration of the cardiac muscle, toxic or degenerative in nature.

To divine in an individual case the meaning of a symptom which may depend upon permanent or temporary causes, and in elderly or young persons subject to one of the toxic infections, is often impossible. It is our duty in such doubts to act on the worse supposition, keeping our own counsel. It is proper to remind the reader that in such infections as diphtheria and influenza these apprehensions must occupy the mind of the physician not only during the acuter phases of the disease, but also during the course of convalescence; indeed, mischief of the kind is more likely to manifest itself during early convalescence, when our vigilance, far from abating, must be redoubled. We must watch suspiciously the least variation of rhythm; and try our best, if such interference occur, to decide whether the arrest be due to vagus inhibition, to extra-stimulus, or to loss of muscular conductivity.

Is there, then, any way of determining whether an intermission —say in a case of diphtheria in a youth, or in a case of pneumonia in a patient in advancing years — be due to vagus inhibition, to "extra-systole," called forth by an intrusive stimulus, such as the poison of an infection or a salicylic salt given in the course of the disease, or to failing conductivity? And, in the last case, whether it signifies no mere temporary perturbation, but some degree of degeneration? Loss of conductivity, before breaking the transmission of stimulus from auricle to ventricle, is apt to cause a retardation in the rate of its transmission; the contraction of the ventricle will follow that of the auricle at a longer interval, and in very skilful hands this interval may be noted on a sphygmogram, or perhaps by radioscopy. Furthermore, each systole will exhaust the cardiac muscle more and more, till a renewal of contraction becomes impossible to the heart, or at any rate to the ventricles; if, therefore, we hear at the heart an intermisson followed by perhaps a faint sough due to auricular beat, but not followed by a short

extra systole; and still more, if we note that the two or three beats immediately preceding succeeded each other at lengthening intervals, we shall fear that the cessation of function may be due to deterioration of the muscle itself, toxic or degenerative; and in the presence of such possibilities we shall consider no proper precaution to be too fastidious.

Certainty in the interpretation of these problems is yet far from us. Defective muscular conduction may begin beyond the auriculoventricular junction; the auricles themselves may fail to take up the sino-auricular contractions, where it is probable that a low head of pressure is always maintained. My own impression is that on comparison of the arrhythmias of central origin, as in intracranial disease, or gastric reflex with those of hearts certainly degenerate, as in senile decay, we may roughly assume that rates of 40–60 may be due to interfering stimuli; rates of 20–40 rather to slow muscular conduction. As arrhythmia, extreme arrhythmia, may be found in all kinds of cardiac disorders, passing or permanent, our aim is to discriminate if possible between a heart out of tune and an incapable cardiac muscle; and in the latter case between an inconductivity due to a temporary incident such as diphtheria and that due to an intrinsic muscular defect of older standing. Again, in elderly persons, say in pneumonia, we may have to deal with a toxic incident intensifying the results of senile decay; an incident which may or may not determine a fatal issue. In such a case the fearless use of strychnine injections may carry even a faulty cardiac muscle through the passing peril. Or again, fluctuations in intraventricular volumes, as in mitral regurgitations, may be revealed in corresponding variations of muscular response. It is thus by the mutual illustration of physiology and medicine that we hope to attain the solution of these and such problems which meet us daily at the bedside.

Fluorescence of Quinine and Other Remedies Used in Malaria. KING, A. F. A. *The American Journal of the Medical Sciences*, vol. cxxiii, No. 6, p. 1025, June, 1902.

A curious study is that of the relation of fluorescence to the development of the malarial parasite. It is claimed that this organism does not sporulate in the dark. The light obtained in the blood must of necessity be red; hence it is thought that the curative effects of quinine may be due to its fluorescence, by which violet rays of light are found in the blood. Two other vegetable products, esculin and fraxin, possess blue fluorescence in a remarkable degree,

and have long been known as remedies for intermittent fever. The former has been authoritatively stated to be quite equal to quinin in its antipyretic power. It presents a far more brilliant fluorescence than any salt of quinin. Fraxin is obtained from the ash tree of Europe, and has often proved successful in intermittent fever where quinin had failed. The curative power of iodin and its compounds, which have long been known to be so efficacious in intermittent fever, may be due to the iodide of starch.

The most remarkable contribution on this subject is that of H. B. Jones, who, experimenting upon the rapidity with which medicinal substances pass in and out of the body, used quinin because of its fluorescence, by which exceedingly minute quantities were recognized. In the progress of this study, a substance was discovered in the tissues of guinea-pigs which possessed all the chemical properties of quinin, including fluorescence. This substance was termed "animal quinoidin." Rhoads and Pepper confirmed the experiments of Jones, and in testing the blood of malarial patients found its fluorescence was below the normal standard.

Fluorescence cannot act except where there is light, and the impotency of quinin in the treatment of the crescentic forms of the malarial parasite is thought to be due to the fact that the latter are not found in the peripheral circulation, but in the spleen, liver, bone-marrow and brain, where the darkness prevents the development of fluorescence. The same mechanism may account for the paroxysms in the tertian, or larger, parasites; these distend the blood corpuscles and are consequently arrested in the peripheral circulation, and are brought in contact with light. They sporulate and cause a systemic reaction with a rise of temperature. The crescentic and smaller parasites not being arrested in the skin, and consequently escaping exposure to light, do not sporulate. Hence the estivo-autumnal, malignant quotidian, and malignant tertian are not accompanied by the malarial paroxysm, at least not with regularity, the condition being that of a progressive toxemia.

(The thoughts suggested by these speculations are of considerable interest to the naturalist as well as the physician. The possibility of explaining the peculiarities of the malarial parasite by the action of light and the curative properties of quinin by the same mechanism, is one that is full of interest and may possibly lead to a better practical management of malarial infections. Sufficient has been advanced by the writer to put some of his speculations beyond the domain of pure fancy.)

Segmentary Edema. DEBOVE. *La Presse Médicale*, No. 43, p. 510, May 28, 1902.

The term "oedeme segmentaire" is a variety of edema which has attracted some attention, a number of cases having been recorded during the last few years.

The case reported is that of a woman twenty-five years of age, with a negative family history. She is one of a family of eight children, none of whom have had a similar trouble. When about thirteeen years of age she noticed that there was difficulty in buttoning the

upper portion of her shoe. This progressive enlargement of the left side has continued to the present, but the circumference of the left leg, as compared with the right, was somewat greater in 1899 than in 1902. The circumference about the ankle of the healthy leg was 27 centimeters, and of the left or affected leg was 40 centimeters, in 1899; in 1902 it was 33 centimeters. The circumference of the thigh near the trochanters was on the right side 50 and on the left side 60 centimeters, there being no diminution in the latter dimension during the last three years. The increase in the size of

the leg is not uniform. The leg has preserved its general form. There is no modification of the color and the leg does not pit upon pressure. Sensibility is normal and motility is intact.

The Anemic Form of Cancer of the Stomach. — MENETRIER, P., and AUBERTIN, CH. *Archives Generales de Medecine*, tome vii, p. 658, June, 1902.

The anemic form of gastric cancer is applied particularly to a malignant disease in which the gastric symptoms are quite absent, and the patient is affected with the general symptoms of cachexia, simulating pernicious anemia. This form of cancer is especially interesting from a diagnostic standpoint, particularly when it is not explained by the examination of the blood. The patients do not have hemorrhage, nor do they suffer from inanition.

A case occurred in a man 43 years of age, admitted November 20, 1901, to the Hospital Tenon. He complained of general feebleness, and for five or six months before entering the hospital there had been a decrease in weight. The digestive troubles were not marked, there was no vomiting, and the digestion was quite normal. The patient was feeble and passed the greater portion of his time in bed. The face was pale. Sometimes he suffered from vertigo. The mucous surfaces were pale; there was no disturbance of the lungs or circulation. The digestive apparatus presented nothing abnormal, there was no vomiting, diarrhea, nor constipation. After a time, in which the patient was on a milk diet, he was placed on the usual food, and had no difficulty in digesting a mixed diet. Palpation in the hypogastric region was negative; no enlarged glands were noted. The urine was free from albumin. Examination of the blood showed erythrocytes 1,476,000 and leucocytes 9300. No nucleated reds were found. Examination of the gastric juice showed an absence of hydrochloric acid. The condition of the patient continued to grow worse, and at the end of a month there was bloody vomiting. A second examination of the blood showed erythrocytes 1,333,000 and leucocytes 11,780, the mononuclear forms being relatively increased. During the second month in hospital there was some tenderness of the epigastrium, but up to the time of the patient's death there was no perceptible tumor.

The autopsy showed a large ulcerated neoplasm at the region of the pylorus, which did not cause obstruction. The histological examination showed an atypical epithelioma of glandular origin, presenting a variety of cells.

Recovery in a Case of Tubercular Meningitis. THOMALLA. *Berliner Klinische Wochenschrift*, 39th year, No. 24, p. 565, June 16, 1902.

Until quite recently, tubercular meningitis was looked upon as incurable. Since Quincke employed lumbar puncture in the diagnosis of these cases this view no longer obtains, as a number of cases have been reported in which the tubercle bacillus was demonstrated in the cerebrospinal fluid, and at the same time the patients recovered.

A student, twenty years of age, who came from a tubercular family, had suffered from localized tubercular trouble of the throat, and also from an anal fistula which had been operated twice and had not healed. One month before being seen, he complained of severe headache accompanied by noises in the left ear. At the time he was well nourished and there was no loss of consciousness. The pain was so severe that subcutaneous injections of morphine were required. There was marked tenderness in the nape of the neck, though there was nothing that pointed to disease of the vertebræ. There were marked contractions of the facial muscles. The lungs were normal. The patient vomited occasionally, and there was fever. Calomel was given to move the bowels and an ice cap was applied to the head, and iodide of potassium and creosote were ordered, with frequent injections of morphine to relieve the pain. A few days later the fever had lessened. At this time an ophthalmoscopic examination showed tubercles in the choroid of the left eye. The creosote was increased in quantity. There was improvement in the patient's general condition. About one month after the severe symptoms, the patient had so far improved that an operation was made upon the anal fistula, one sinus of which was closed, the other remaining open. At this time another ophthalmoscopic examination showed that the tubercle had disappeared from the choroid. Later the patient was sent to the seashore. The headache had disappeared, and the anal fistula finally closed.

The diagnosis of tubercular meningitis in this case was regarded as confirmed by finding the tubercles in the choroid.

The Mobility of the Kidney from the Standpoint of the Internist. MADSEN, S. *Nordiskt Medicinskt Arkiv*, Bd. 35 3:e.; *Foljden*, Bd. ii, April 30, 1902.

A movable kidney is relatively frequent in women between 20 and 50 years of age. The right kidney is commonly more movable than the left. Frequently this condition is associated with enteroptosis, though one is not directly caused by the other. Abnormal

mobility of the kidney may be present without causing symptoms, but usually the condition gives rise to more or less direct or indirect disturbance. Frequently these are included under the term functional digestive disorders, commonly grouped under the name dyspepsia. A general neurasthenia is not infrequently found associated with this abnormality. The causes of abnormal mobility of the kidney are to be found in a want of muscular and ligamentous development. In addition, an abnormal position of the kidneys in the abdominal cavity and in reference to other organs. Frequently child-bearing is a cause, and rarely a direct or indirect trauma may be responsible for the displacement.

SURGERY.

Two Cases of Intussusception.—MORISON, J. R., and HESLOP, J. W. *The Lancet*, vol. clxii, No. 24 of vol. 1, p. 1689, June 14, 1902.

Mr. Morison reports from the Royal Infirmary, Newcastle-on-Tyne, two interesting cases of obstruction of the bowels, one due to intussusception, the other to polypus. In Treves's statistics, eight per cent of cases of intussusception are due to polypi and diverticuli.

Case 1 was that of a boy aged five years, who was seized with severe pain in the morning and shortly afterward vomited. He reached home about noon and the bowels were then moved. The pain came on in paroxysms about every five minutes. In the afternoon some blood was passed. During the night there was occasional vomiting. In the evening of the day following the onset of the symptoms he was brought to the infirmary. The pulse was good and the tongue clean, but the face was pale. The abdomen was not rigid nor distended. In the left iliac region a distinct, elongated swelling could be felt. The tumor could not be reached except by bimanual examination, when it could be pushed down so that its outlines could be determined through the walls of the rectum. The abdomen was opened in the left iliac region by an oblique incision. The bowel was drawn forward out of the abdomen and the intussusception found to be about six inches long, and involving only the small intestine. The bowel was then wrapped in a warm, flat sponge and was steadily squeezed until its size was reduced, and, by traction from above and pressure from below, the invaginated portion was replaced. After the reduction a firm tumor about the size of the little finger could be felt through the intestinal wall in the

lumen of the bowel opposite the mesenteric attachment. A longitudinal incision one inch long, made in the intestine, showed a Meckel's diverticulum which had formed the apex of the intussusception. The intestinal opening was closed transversely by a continuous catgut suture. The specimen showed an intestinal diverticulum turned inside out, measuring one and a half inches in length, becoming wider from base to apex, and ending in a somewhat bulbous

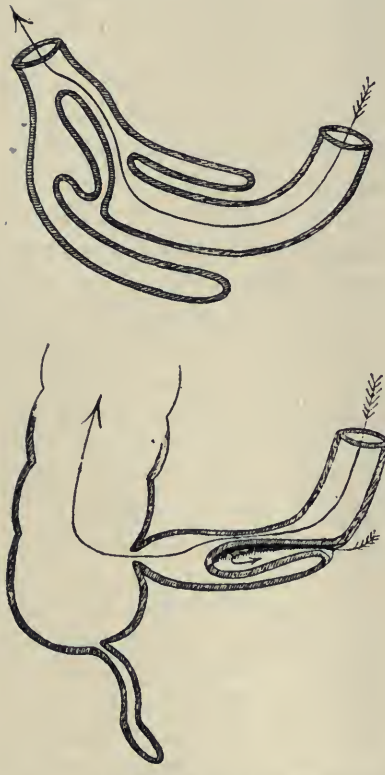


FIG. 1.—Diagram illustrating intussusception due to an inverted Meckel's diverticulum.

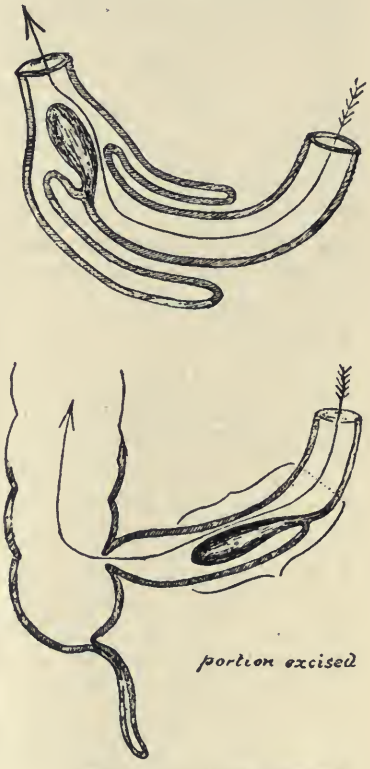


FIG. 2.—Diagram illustrating intussusception due to a polypus.

extremity. There were patches of gangrene in its walls affecting the mucous membrane chiefly. The patient recovered.

A second case reported by Dr. Heslop was that of a miner 62 years of age who had been in good health until four months before he came under observation, when he complained of pain in the lower part of the abdomen, paroxysmal in character. During the last month the pains were violent, lasting from sixteen to twenty hours at a time. They occurred nearly every day, and were accom-

panied by profuse vomiting and sweating. The pains were only relieved when the bowels were moved, and this could only be brought about by the administration of enemata. During the spasms the bowels swelled and became hard, the swelling being most marked in the right lower abdomen. On admission there was distention in the right iliac fossa, where a distinct rounded flat mass could be felt. Rectal examination was negative.

An oblique incision extending from the ileocostal space to the median line in front, dividing the rectus and other muscles, showed a round swelling of the ascending colon, evidently an intussusception. It extended from the right iliac fossa to the middle of the transverse colon. The intussusception was readily reduced excepting the last two or three inches. This was towards the end of the ilium and contained a firm, round tumor. The portion of intestine including it and some thickened mesentery, with some large glands, were excised. The mesentery and intestine involved in the intussusception were so thickened and altered by old adhesions that until the excised portions and cut ends were carefully examined it was not recognized that the portion removed concerned the ileum only and that the distal incision left two inches of ileum attached to the cecum. The divided intestine was thickened and friable and was too weak to allow a lateral anastomosis. An end-to-end union was effected by a continuous suture of catgut through all the coats, and under this an uninterrupted layer of catgut sutures. The loose omentum was drawn down and wrapped around the anastomosis.

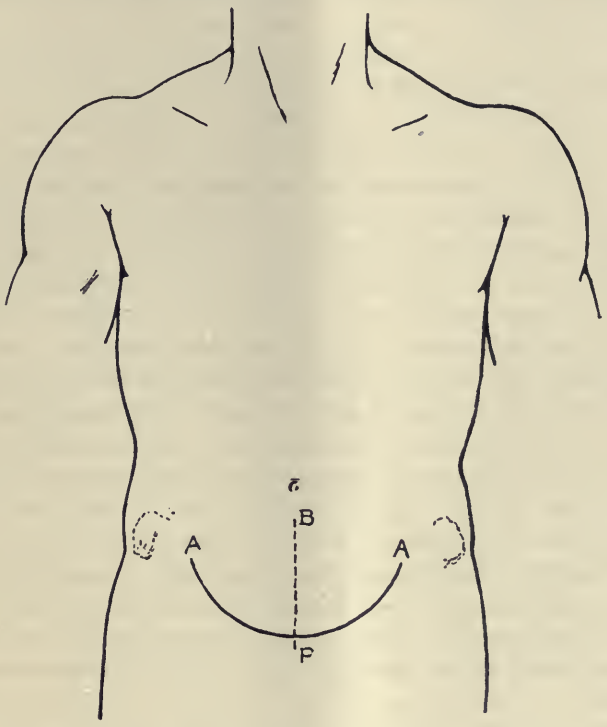
The portion of intestine resected measured three and a half inches. The mass was found to be a rounded polypus the size of a walnut. A microscopic examination of the growth showed it to consist of connective tissue with numerous vessels. Parts of it resembled myxomatous degeneration, but this may be accounted for by edema. The surface was covered with normal mucous membrane.

Combined Transverse and Longitudinal Incision in Laparotomy. — Stimson, L. A. *Medical Record*, vol. lxi, No. 26, p. 1033, June 28, 1902.

The object of this incision is to prevent ventral hernia, which frequently occurs after a median laparotomy. Many methods of opening the abdomen have been employed, but none seem to have won general acceptance. The principle of intermuscular operation, as advocated by McBurney in the removal of the appendix, has proven so successful that it appears that it might be employed in opening the

abdomen for other purposes. This incision has been employed in more than fifty cases.

A curved transverse incision is made through the skin, aponeuroses, and fascia of the recti, followed by the usual longitudinal separation of these muscles. The incision crosses the median line about four centimeters above the margin of the pubis, and extends on each side toward the anterior superior spine of the ilium to a distance varying with the amount of the subcutaneous fat. It is then carried through the aponeuroses and fascia of the rectus on each side, its outer portion



following the direction of the fibers of the aponeurosis and the deeper portion not extending beyond the outer edge of the rectus. The upper flap thus outlined is raised from the muscles by division, and its attachment to the septum constituting the linea alba. The fascia below the incision is similarly freed toward the symphysis. The recti are then separated and the peritoneum divided in the median line in the usual manner. In closing the wound, the peritoneum is sutured and the flap replaced and secured by catgut sutures. The fascia and aponeuroses are sutured separately in the outer part of

the incision. The skin is united with silk. If a drain is required, it is placed in the center of the incision in the median line.

The longitudinal portion of the incision can easily be extended toward the symphysis, or upwards two-thirds of the distance toward the umbilicus. The division of the fascia and aponeuroses permits easy separation of the recti, and greater space is obtained for intra-abdominal manipulation than with longitudinal incision directly through the wall of the abdomen. In this method of making the incision, the transverse portion is protected from a separating strain by the uninjured recti beneath it, and the longitudinal portion by the overlying fascia.

The Present Status of the Bottini Operation. — Horwitz, O. *Pennsylvania Medical Journal*, vol. v, No. 9, p. 465, June, 1902.

The recorded experience of numerous surgeons whose reputations are sufficient guarantee for their statements refutes the charges that this operation is "uncertain, dangerous, and the results obtained are temporary in character." It is true that the surgeon must rely on a sense of touch for the successful performance of the operation, and in that sense it is a "blind" operation. But it is not so much so as the ordinary procedure of tearing out the prostate gland through a small incision made in the capsule, the organ being reached through an opening into the perineum, and so working by sense of touch at the bottom of a dark cavity. An advantage in the operation is that there is less objection to it on the part of the patient than to any other surgical procedure thus far suggested in prostatic hypertrophy. The operation is quickly performed, there is slight shock, usually little loss of blood, convalescence is rapid, and the mortality is lower than in any other radical measure. Cures result in a large majority of the cases if the operation is undertaken early. The failures are comparatively few.

The operation is contraindicated when a valvular formation exists, or where there is marked overgrowth of the three lobes associated with tumor formation, giving rise to a pouch above and below the neck of the bladder. Pyelitis, when present, adds to the danger of the operation, but does not necessarily contraindicate it. The character of the growth has but little bearing on the results. In suitable cases it is not only the best radical measure thus far devised for the relief of prostatic hypertrophy, but it is attended with the smallest mortality. It is especially indicated in the early obstructive symptoms of hypertrophy.

Acute General Gonorrheal Peritonitis.—HUNNER, G. L., and HARRIS, N. M. *Bulletin of the Johns Hopkins Hospital*, vol. xiii, No. 135, p. 135, June, 1902.

The writers add seven additional cases to those already published, which gives a total of thirty-nine cases of general peritonitis due to infection by the gonococcus. The proportion of recoveries was 69 per cent, which indicates a good prognosis in this disease when compared to peritonitis due to other infections. Operation did not favorably influence the course of recovery in most of the cases; on the whole the cases treated symptomatically seem to have done about as well as those that were operated. While surgical measures in this form of infection are of doubtful value, the differential diagnosis needs careful consideration; where there is a reasonable doubt operation should be performed. The usual complex of symptoms in inflammation of the appendix are quite readily recognized. A general peritonitis arising from gonorrheal infection is even more characteristic in its preliminary phases. A history of a blenorrhea of recent date, or long standing, with the discovery of gonococci in the urethral or glandular secretions, should make the surgeon very suspicious. If with its onset there is a history of pelvic pain and tenderness and a mass can be made out in one or both (preferably) ovarian regions the diagnosis becomes probable. If a general peritonitis accompanies the above conditions and has occurred immeately after the manipulation of pus tubes, or during the menstrual period, or in the puerperium, the diagnosis is almost a certainty. If the peritoneal cavity is opened and a dry, plastic peritonitis characteristic of gonorrheal infection is discovered, the intestines should be disturbed as little as possible. If the tubes contain pus in appreciable quantities they should be removed. The symptoms of gonorrheal peritonitis are similar to those from other infections, namely, abdominal distension, tenderness and rigidity, vomiting, and elevation of temperature. If after an acute onset, with severe symptoms for from one to three days, the disease suddenly abates and the patient makes an uneventful recovery, it may be concluded that the infection is gonorrheal. There is usually a legacy of intraperitoneal exudates, adhesions, or pus tubes.

Resection of the Twelfth Rib in Exposing the Kidney.—CULLEN, T. S. *Bulletin of the Johns Hopkins Hospital*, vol. xiii, No. 135, p. 149, June, 1902.

Before the Johns Hopkins Medical Society, February 13, 1902, Cullen exhibited a patient, 47 years of age, who had been operated

upon for tuberculosis of the kidney. The cystoscopic examination of the patient showed slight reddening around the left urethral orifice; the right was normal. On catheterization, the urine from the right kidney was found to contain albumin, and that from the left contained enormous numbers of tubercle bacilli, a single field showing hundreds of them. It was necessary to remove the entire kidney, and to obtain a wider field of operation the twelfth rib was excised. This augments the space one-half or more, and one is

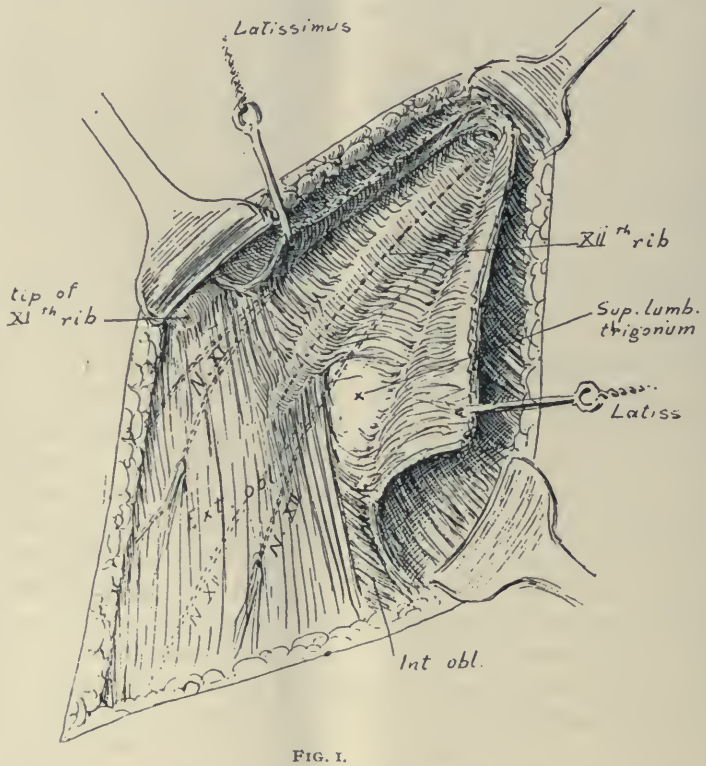


FIG. I.

enabled to control the vessels under sight and with the utmost ease. The incision was commenced from the lower margin of the eleventh rib, continued downward and slightly forward until within two inches of the crest of the ilium, when it was carried forward parallel with the crest. The skin flap was dissected forward until the margins of the latissimus dorsi (Fig. 1) were exposed. The twelfth rib was then located and the latissimus severed until the requisite amount of rib was exposed. The periosteum of the rib was pulled

back from two to four inches and the bone removed, and the superior lumbar trigonum exposed, with the kidney lying beneath the opening thus obtained.

This operation, with slight modification, has been employed by several German surgeons with good success. There is a possibility

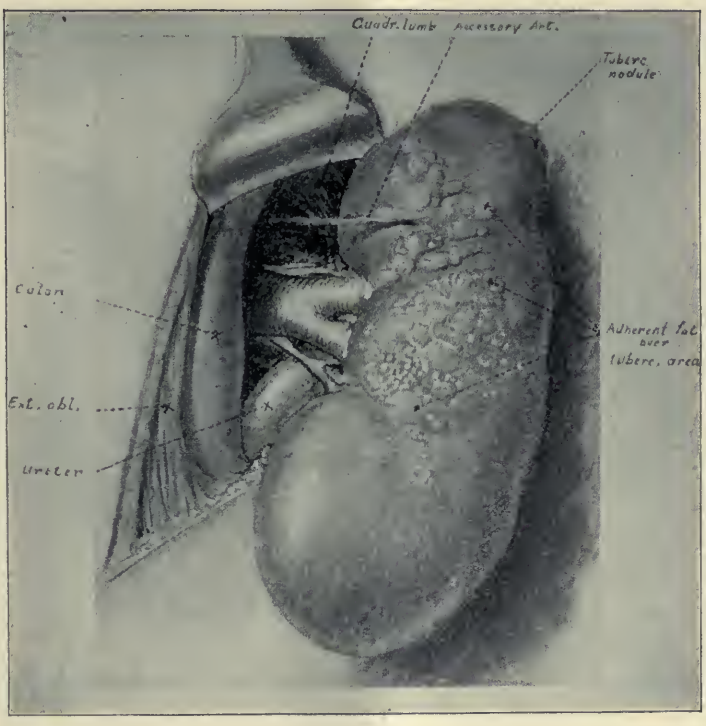


FIG. 2.

of opening the pleural cavity, if care be not exercised. Should such an accident happen, it can be closed by suture.

The Fixation of Movable Kidney by Means of Strong Carbolic Acid.—CARWARDINE, T. *The Lancet*, vol. clxii, No. 26 of vol. i, p. 1822, June 28, 1902.

The method which the writer has adopted is regarded by him as an improvement upon the usual means of scarification or peeling of the renal capsule. It is applicable to all the recognized forms of nephropexia and gives greater security than any other method of anchoring the kidney.

It consists in painting the whole surface of the kidney except the hilum with the strongest liquid carbolic acid, so that the surface becomes covered with granulation tissue within a few days. The painting is best done after the supporting sutures have been inserted, but before they are tied. A swab is employed, but care is exercised that it shall not contain an excess of the liquid. In four cases in which the kidney was sustained by gauze slings and packing, in which the writer had an opportunity to watch the kidney for a period of three weeks, he was able to note the rapidity with which the granulations formed and how firmly the kidney was incorporated with the surrounding tissues. The kidney could be seen to move with the respiration in conjunction with the parts surrounding it, and on pressing upon the exposed renal surface it was found to be inseparably attached, even in those cases in which no sutures were used. In a case treated in this way, combined with gauze packing, he was able to verify the results a year afterward. On going through the old scar for the relief of pain, there was no differentiation of the scar tissue visible until the cortex of the kidney was actually cut into, so intimate was the fixation. Suspension with gauze combined with cortical carbolization, which he has carried out in six cases, has given excellent results, and there have been no contraindications. One patient had temporary hematuria on leaving the bed, which was attributed to too tight suturing.

Incision in the Reduction of Dislocation of the Clavicle.—Moore, J. E. *Annals of Surgery*, vol. xxxv, No. 5, p. 578, May, 1902.

Attention is called to the unfavorable results in the treatment of dislocations of the outer end of the clavicle by the usual methods of strapping and bandages. A case in which this dislocation was accompanied by a break in the bone later healed but there was marked displacement of the shoulder, giving a deformity that could be seen through the patient's clothing. The difficulty in reducing the dislocation is due to the torn acromioclavicular ligament between the separated bones. In the open operation the joint is cut down on, the ligament removed, the bones replaced and sutured. In a case reported silver wire was used, and the results, as to strength, configuration, and motility, were excellent. There is a theoretical objection to the use of silver wire, and it might be replaced by kangaroo tendon, which is strong, elastic, and sufficiently durable.

THERAPEUTICS.

Roentgen Rays in the Treatment of Cancer.—GROVES, A. *The Canadian Practitioner and Review*, vol. xxvii, No. 6, p. 313, June, 1902.

TRELOAR, T. R. *Australasian Journal of Pharmacy*, vol. xvii, No. 197, p. 159, May, 1902.

Groves reports the case of a woman 59 years of age, admitted to the hospital January 31 last. She was the mother of ten children, and her illness began two years ago, the commencement being a dragging down feeling accompanied by a profuse vaginal discharge, with pain at the top of the head. She had been gradually losing strength. A vaginal examination showed a lacerated cervix covered with a fetid discharge. The structures bled upon the slightest touch. A diagnosis of epithelioma of the uterus was made. Operation was out of the question, and it was decided to try the effect of the Roentgen rays. The sittings averaged fifteen minutes, and were given daily. At the end of two weeks there was little apparent result with the exception of the relief of pain. Afterward the odor decreased, the ulcerating surface showing signs of healthy granulation. Thirty days after beginning treatment, the lacerated cervix had nearly healed, there was no odor from the discharge, or tenderness, and the pain had ceased. Two months later she was free from all signs of the disease.

A patient with cancer of the rectum, with vesicorectal fistula of five years' standing, was placed under treatment. There was subjective improvement and lessening of pain. The case has not been sufficiently long under treatment to predict anything as to the possibility of a restoration in so severe a case.

The case of Mr. Treloar was that of an ulcerous growth which is described as a "rodent ulcer." It was cured by the application of the *x*-rays. Some eight years ago the patient was struck by a splinter of wood, and about seven months after a piece of wood was removed from below the eye. Twelve months subsequently the growth made its appearance, and it spread until the eye was closed and the sight threatened, the tissues and skin surrounding it being partially eaten away. After four applications of the rays the growth showed signs of arrested progress and eventually began to diminish in size. On the twenty-fifth application the growth was found to have entirely disappeared, the eye had reopened, and the patient could see as well with it as with the other.

Mr. Treloar is a chemist who is demonstrator of the *x*-rays to

the District of Ballarat. He has lately designed a special form of vacuum tube for treating cancer, ulcer, lupus, and kindred diseases.

Santonin in Amebic Dysentery.—MYER, J. S. *St. Louis Medical Review*, vol. xlvi, No. 2, p. 19, July 12, 1902.

The fact that twelve cases of amebic dysentery have been observed in St. Louis within eight months leads the writer to the conclusion that the disease is more common in that region than is generally supposed. Ten of these cases were patients in the St. Louis City Hospital. Of the two cases reported by Myer, one was born in Chicago, and had never been south, and, in fact, rarely out of Illinois or Missouri. On September 16, 1901, he had a slight diarrhea, which continued for several days. Twelve days later there was a pronounced diarrhea, the stools being from ten to fifteen times daily and containing a considerable quantity of blood and mucus. At the end of the month the patient was greatly reduced, and he was then put upon santonin, which produced rapid amelioration in the symptoms. The patient discontinued the treatment contrary to advice, and had a relapse, but under santonin the symptoms finally cleared up.

The second case was that of a laborer who lived in Granite City, Ill., and who had never been south. In October, 1901, he complained of soreness in the abdomen, which increased in severity. Three days later there was a diarrhea. Large numbers of amebæ were found in the stools. The same treatment was given in this case, namely, santonin in three-grain doses, together with a liquid diet. The amebæ disappeared from the stools within three days. Later he had a relapse, which was relieved by the same treatment.

Emphasis is laid upon the value of santonin as shown in these two cases, since it is the only treatment that seems to be specific. While two cases are too few to draw conclusions from as to the value of the remedy, it is to be remembered that the first case reported was a very virulent infection, and that the administration of santonin was followed by a prompt improvement in the symptoms.

The X-rays in the Treatment of Malignant Growths.—BECK, C. *New York Medical Journal*, vol. lxxv, No. 21, p. 881, May 24, 1902.

The writer discusses the changes produced in the tissues by the application of the *x*-rays, particularly in the treatment of malignant growths. *X*-ray burns are divided into three groups: (1) Those in

which there is a simple hyperemia, followed by a moderate exfoliation; (2) those in which blisters form; (3) those characterized by deep destruction of the irradiated tissues. The *x*-rays differ from ordinary burns in the fact that they take from two to three weeks to develop.

The curative effect of the *x*-rays in carcinoma, and especially in epithelioma and all superficial malignant growths, has been established by so many observers that there can be little doubt of its efficacy. The technical application of the rays is comparatively simple, but some rules must be observed. Deep burning and extensive destruction of the tissue must be avoided; there is a marked idiosyncrasy on the part of some individuals to the *x*-ray. The first exposure should be for about five minutes, and after a week for ten minutes. If no reaction follows the third exposure it may be assumed that the patient has no idiosyncrasy, and then the part may be irradiated every two or three days, and at last daily, unless reaction follows. When the first exposures are made the distance of the tube should be four inches; later on it may be one inch. In neoplasms confined to the skin, soft tubes are preferable, but those in which the growth is more deeply situated should be exposed to the action of the hard tube because of its great penetration. A shield of lead must be fastened around the area to be irradiated in non-malignant disease. In the treatment of neoplasms a shield should not be employed, since it is aimed to have the rays extend as far as possible. During the intervals xeroform one part and lanolin ten parts should be employed.

Bichloride of Mercury in the Treatment of Smallpox.—RIDINGS, E. W. *The Southern Practitioner*, vol. xxiv, No. 6, June, 1902, p. 289.

The extended epidemic of smallpox in the Southern States in the last few years has led to numerous communications from southern physicians on the value of the bichloride baths in the treatment of smallpox.

The writer reports a number of cases in which there was a marked amelioration of the symptoms. One was a patient with confluent smallpox. He was sponged thoroughly with a solution of bichloride, 1 to 250. The nose, mouth, eyes, and ears were sprayed with a saturated solution of boric acid. The bath was repeated every six hours for forty-eight hours, and then every eight hours for a like period, after which it was only used night and morning. At the time of the patient's first bath his face was swollen and the eyes closed. In the first twenty-four hours follow-

ing this bath the swelling was rapidly reduced. There was no secondary rise of temperature, the pustular stage seeming to be aborted by the baths.

In the above case a number had been exposed, and some during the entire course of the disease were in close contact with the patient, and not one of these contracted the disease. Two other localized epidemics are described. In one, seven cases developed among a gang of thirty-five negroes and six white men. Notwithstanding the exposure, none of those who had not developed the disease up to the time the treatment was instituted had the disorder. A smaller epidemic occurred in a family, two children coming down with the disease. In this family there were four exposures, two women and four children, none of the latter being protected by vaccination, but none of them contracted the disease. In all of the cases reported there was no secondary fever, no itching, and no pitting.

Cancroin in Cancer. — KRETZMER. *St. Petersburg Medicinischer Wochenschrift*, 27th year, No. 20, p. 191, May 18 (31), 1902.

The writer refers to Professor Adamkiewicz's experience in the treatment of carcinoma with the substance known as cancroin. We have in former issues mentioned the reports of this remedy. In all, Adamkiewicz claims to have treated about twenty-five cases of carcinoma, particularly of the internal organs, the most of the cases being benefited. One of the most recent reports was that relating to six cases of carcinoma of the esophagus, two of which were under the care of Kretzmer. One of these patients was treated for three months with cancroin, this being followed by marked improvement. Later there was a rapid increase in the disease, and at the end of two months the patient died. This case, however, gave up the treatment after a certain amount of improvement, and received no further injections, so it counts for little in estimating the curative effects of the substance.

A second case was that of a woman who was placed upon the treatment in October, 1901. The injections were given for one and a half months. She had the ordinary symptoms of stenosis at the lower end of the esophagus. Toward the end of 1901 even fluid food could not be taken. This patient reacted very promptly to cancroin. In a few days the ability to swallow returned. In all she received twenty-six cancroin injections. The subjective difficulties entirely disappeared.

The writer admits that the value of cancroin injections in car-

cinoma is not by any means established, but the results obtained in the few cases in which it has been used are sufficiently striking to justify its employment in inoperable cases.

Hyoscin in the Treatment of the Morphine and Alcohol Habits. HARE, H. A. *Medical News*, vol. lxxx, No. 23, p. 1076, June 7, 1902.

The writer reports a case of a patient who had been addicted to morphine for a long time, using about twelve grains of the drug by the mouth in twenty-four hours. The mental condition of the patient had become very bad. He was put upon large doses of hyoscin hypodermically. As a result the pupils became widely dilated, the tongue dry, and there was a mild delirium with visual hallucinations. The large doses of hyoscin were continued for a period of two weeks and then were gradually decreased. The hyoscin at once relieved the craving for morphine, and several months have passed with no return to the habit.

Several cases reported by the writer were not sufficiently long under observation to enable him to draw a conclusion as to the probable effect of the hyoscin in relieving the craving for morphine, but it is stated that in the patients in whom the drug was abruptly discontinued there was none of the pain and distress which is so commonly met with. In one case in which a double habit of alcohol and morphine was formed the administration of the hyoscin was followed by equally happy results. In all the drug was used upon six patients, the dose frequently reaching one-quarter grain hypodermically each day. In all of the cases there was slight if any suffering due to withdrawal of the morphine, and there was prompt relief from the distressing craving for the drug.

Suprarenal Liquid with Chloretone in Diseases of the Ear and Nose.—HERRON, J. T. *The Southern Practitioner*, vol. xxiv, No. 7, p. 356, July, 1902.

The writer has found suprarenal combined with chloretone efficacious in acute drum troubles. The pain of acute purulent otitis media is frequently relieved by a few drops of suprarenal with chloretone, dropped into the ear, the patient reclining upon the opposite side for about ten minutes. The application should always be preceded by a careful cleansing of the ear with hot boric acid solution. A case in which a large abscess had opened into the external meatus a short distance from the drum, and accompanied by severe pain, was relieved by a single application. In the pain which accompanies involvement of the ear in influenza, marked relief was obtained

from the applications. In a similar case not treated in this way the drum ruptured in less than an hour. This case later had involvement of the other ear, which was treated with suprarenal and the inflammation soon disappeared without it being necessary to open the drum membrane, there being no spontaneous rupture. The writer is of the opinion that the use of this combination of chloretone and suprarenal frequently lessens the severity of aural inflammations, the inflammation terminating in resolution in the catarrhal stage and not going on to suppuration and perforation of the drum.

The Injection of Air in the Treatment of Neuralgia.— ROMME, R. *La Presse Médicale*, No. 43, p. 511, May 28, 1902.

This extraordinary method of treating neuralgia is attributed to M. Cordier (*Lyon Médical*, No. 13, 1892), and is said to be applicable to neuralgia, sciatica, and lumbago. It consists in the injection of air into the subcutaneous tissue. It is claimed that by this method there is obtained a stretching of the nerves which proves efficacious in the most rebellious cases, particularly those of sciatica.

The method does not require a complicated apparatus. All that is needed is a hypodermic needle to which is attached a rubber tube connected with a force-pump. A bulb containing cotton may be interposed to filter the microörganisms from the injected air. Very slight pressure is required in injecting the air, and this varies somewhat with the part in which the injection is made.

Of twenty-five cases treated by subcutaneous injection of air, Cordier met with only two failures. Cure commonly followed the fourth or fifth injection. In lumbago a cure often followed a single injection, air sometimes being injected into the muscular mass as well as subcutaneously.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

The Lymphatic Constitution.—PEACOCKE, G. *Medical Review*, vol. v, No. 5, p. 280, May, 1902. (Transactions of the Royal Academy of Medicine in Ireland, vol. xix, p. 53.)

The term "convulsions" is often given as a cause of death in children when it is merely descriptive of a symptom of a morbid state. Four cases of sudden and unexpected death in which the lymphoid tissue in various parts of the body was markedly abnormal have come under the writer's observation.

Case 1.—A child was brought to the hospital, the parents assert-

ing that he was perfectly well on going to bed the previous night. On waking in the morning he "looked queer." He was immediately brought to the hospital; on arriving there life was extinct. A thorough necropsy revealed only an enlarged thymus, large mesenteric glands, swollen Peyer's patches, and solitary follicles prominent throughout the entire intestinal tract, but especially so in the duodenum and jejunum.

Case 2.—A boy ten years of age had apparently not been in his usual health for a few days, but was not sufficiently indisposed for the parents to seek medical advice. He was suddenly seized with an attack which was described as convulsions, and when brought to the hospital was dead. The necropsy, as in the previous case, showed that he was well cared for. There was slight congestion of one lung, the mesenteric glands were enlarged, Peyer's patches and the solitary follicles were prominent and swollen, all the other organs healthy. No note was made of the condition of the thymus, so presumably it was not large.

Case 3.—A healthy, well nourished, and rather big child had been under treatment for nevus on the lower lip. Electrolysis had been used on several occasions, under chloroform. No enlarged superficial glands were noticeable. One lung showed some congestion, and there was one slightly enlarged bronchial gland. The thymus measured four inches in length. The mesenteric glands were greatly enlarged, Peyer's patches were prominent, and the solitary follicles of the large intestine were enlarged. The spleen was firm and somewhat enlarged.

Case 4.—A small, badly nourished child aged nine months died suddenly. The mother said he was in his usual health until the previous day, when he seemed to have a slight cold, with a cough. He had been given his dinner of bacon and cabbage, when he was seized with some kind of a fit, in which, according to the mother, his face became quite black. When brought to the hospital life was extinct. The necropsy showed that the inguinal axillary glands were considerably enlarged. In each lung was a patch of congestion. The bronchial glands were not enlarged; the thyroid and larynx appeared normal. The thymus measured three inches in length; the mesenteric glands were much enlarged, but there was no hyperplasia of the lymphoid structures in the intestine. The spleen was enlarged, and Malpighian corpuscles were well marked. The brain was not examined.

These four cases have the following common features: Up to the time of death the children were, to all appearances, healthy, or only

suffered from some trifling ailment. Death was sudden and quite unexpected. The necropsies revealed morbid appearances only in those parts in which lymphoid tissue is found.

Microscopic examination of nearly all the organs in Cases 3 and 4 showed that they were normal with the following exceptions: The solitary follicles and Peyer's patches were enlarged from increase of adenoid tissue. The thymus and lymphatic glands were enlarged from increase of adenoid tissue. The thymus and lymphatic glands showed simple hypertrophy. The thyroid in Case 3 was infiltrated with round cells, probably inflammatory. The spleen showed slight increase of adenoid tissue. In Case 4 there was marked increase of adenoid tissue in the spleen, where it infiltrated the pulp to a considerable extent.

A case subsequently coming under the writer's notice was that of a boy six years of age, who was admitted to the hospital with the statement that he had been taken suddenly ill in the morning. The symptoms were fever, headache, some irregularity of the pulse, and retraction of the head. There was a discharge from the right ear. The respiration was rapid. He died within twenty-four hours from the onset of the illness. The necropsy showed the brain was healthy. The thymus was very large and the lungs pneumonic. There was enlargement of the mesenteric glands, but the spleen was not affected. The solitary follicles of the small intestine were enlarged and prominent, and Peyer's patches were distinctly swollen. The solitary follicles were distinct, but not so swollen as those of the small intestine. The cause of death was no doubt primarily pneumonia, but it is unusual for this disease to cause death within twenty-four hours in an apparently healthy child. The lymphatism seemed to be responsible for the sudden collapse.

Pregnancy in a Double Uterus; Removal of Pregnant Portion.—Jay, M. *The Australasian Medical Gazette*, vol. xxi, No. 5, May 20, 1902.

The subject of this remarkable tumor was a woman 25 years of age, the mother of one child, the confinement having been normal. She was not subject to any disturbance of menstruation. She consulted in September, 1901, complaining of backache, lassitude, and a vaginal discharge which commenced with a miscarriage some months previously. On examination there was found some erosion of the os, the uterus was enlarged, retroverted, and pushed to the right. An ill-defined swelling was found in the broad ligaments, this tumor seeming to spring from the left uterine wall. An operation was advised. In November, pregnancy supervened and the

operation was postponed. In December there was uterine hemorrhage, recurring daily, and a curettement was done. The uterus was found to be enlarged and pushed still more to the right. It was empty. The tumor had considerably enlarged. She improved after the curettement with the exception of persistent nausea. The following February the abdomen was opened and a tumor found to the left of the median line. On the right the uterus was brought into view, and attached to it was only one tube and ovary. The left tube and ovary were normal and were found attached to the left side of the tumor. The tumor took its origin about two inches from

A, Body of uterus. B, right tube and ovary. D, tumor containing fetus attached to left wall of uterus by a (E) pedicle having the anatomical characters of a uterine cervix. F, left tube and ovary removed with tumor. H, cervix. G, vagina.

the fundus of the uterus. The patient was placed in the Trendelenburg position, the left ovarian artery and the layers of the broad ligament opened. The tumor was then enucleated down as far as the uterine artery, which was tied. The tumor was found to spring from the uterus at the junction of the cervix with the body, by a pedicle an inch in diameter. This was fixed and tied, and the tumor removed.

On cutting through the pedicle, which resembled an ordinary cervix, a small opening was exposed in the tumor, from which projected a thick plug of mucus. The pedicle was tied off and the

stump covered with peritoneum, the tumor being removed. The uterus, which presented a lop-sided appearance, with its one tube and ovary, was then fixed to the parietal peritoneum and the wound closed. On opening the tumor it was found to contain a three-months' fetus. The specimen presented all the anatomical characters of a pregnant uterus removed at the cervix, and having only one tube and ovary. The patient made a good recovery.

Adnexopexy.—BEYEA, H. D. *American Medicine*, vol. iii, No. 26, p. 1087, June 28, 1902.

By adnexopexy is understood a surgical elevation of the prolapsed ovary and tube. It is used in simple prolapse of the ovary and tube, either into the rectouterine or Douglas's pouches. It is also applicable to those chronic inflammatory conditions of the tube and ovary in which there is some degree of prolapse, and in which the pathologic changes have not become so extensive as to require ablation of the structures. That a prolapsed ovary may be symptomless, or, on the other hand, may cause grave nervous disturbances, is generally admitted. If permanently replaced in its normal position, the local congestion and inflammation which seems to be the cause of these nervous troubles is relieved and there is a return to normal size and function.

The method of operation is as follows: The abdomen is incised, and any adhesions of the prolapsed ovary and tube are carefully separated. The fimbriated extremity of the tube is caught and drawn forward, exposing the suspensory ligament. A fine silk suture is placed through a small portion of the double end of the suspensory ligament, and then through the ligament near its pelvic attachment. Two or three sutures, or a sufficient number to close the fold made in the ligament, are placed below this one. The sutures are then tied. Care is taken not to include the ovarian artery or constrict it in the suturing. The position of the first suture determines the degree of elevation of the adnexa. It may be necessary to include in the suture the tubo-ovarian ligament.

Fractures of the Clavicle in Spontaneous Labors.—RIETHER, G. *Wiener Klinische Wochenschrift*, 15th year, No. 24, p. 619, June 12, 1902.

A number of cases are reported in which there was fracture of the clavicle in spontaneous delivery. This observation seems to be quite new, and it is of interest to accoucheurs, and has some forensic importance. From June, 1901, until the end of May, 1902, sixty-five cases were observed in the three lying-in clinics of the

Vienna General Hospital. The most frequent site of the fracture was in the middle of the bone. In cases where the separation of the fractured end was incomplete it furnished a green-stick fracture. The symptoms of this condition are not very distinct, and unless the condition of the clavicles is carefully examined it is easily overlooked. A falling forward of the shoulder on the side of the fracture is one of the most constant symptoms. In some cases there is no abnormal mobility. Crepitation is readily obtained in some cases, and again it is absent. The prognosis is always favorable, due to the power of repair of bone in early life. As a rule, good consolidation is found at the end of fourteen days.

The Pathologic Anatomy and Treatment of Uterine Rupture During Labor.—SAUVAGE, C. *Thése*, Paris, 1902, No. 305.

The frequency of ruptures incomplete to those complete is in the proportion of one to two. The principal sites of rupture are in the order of frequency: Rupture of a border of the uterus, usually the left intraligamental, incomplete, or complete—ordinarily this rupture is a little in front of or behind the vascular pedicle of the uterus; a transverse, or oblique rupture, complete, and sometimes incomplete, of the anterior wall of the uterus; a transverse, or oblique rupture, very rarely incomplete, of the posterior wall of the uterus; a rupture involving two segments, uniting at a variable angle. Ruptures in a great majority of cases are located in the inferior segment; very rarely are they prolonged into the body of the uterus or into the vagina.

In extracting the fetus, if a diagnosis of rupture has been made, no effort should be made to deliver along the natural channel, unless the head has engaged in the pelvis and there is an absence of dystocia. Laparotomy is indicated in all cases in which the diagnosis of rupture has been made.

FORENSIC MEDICINE.

Requirements of a Privileged Communication.—*Journal of the American Medical Association*, vol. xxxix, No. 2, p. 103, July 12, 1902.

The Court of Appeals of New York holds that section 834 of the New York Code of Civil Procedure, by which a person authorized to practice physic or surgery is not allowed to disclose personal knowledge which he acquired by attending a patient in a professional capacity, is only operative when three elements must coin-

cide: (1) The relation of physician and patient must exist; (2) the information must be acquired while attending the patient; (3) the information must be necessary to enable the physician to act as a medical attendant.

In the case that led to the decision under consideration, an objection was raised to the physician testifying on the ground that the communication was privileged. The circumstances were that the physician was at the scene of the accident when the ambulance arrived, that he gave such necessary aid as was required, and accompanied the patient to the hospital in the ambulance. After this, while acting as a surgeon for the railroad company, he visited the patient in the hospital and had a conversation with him relative to his injuries. The court held that the circumstances set forth in this case were not sufficient to raise the question of the relation of physician and patient, nor were the communications to be regarded as privileged. In speaking of the circumstances which led to the accident, such information would only be privileged if it was shown that it was necessary in the treatment of a case.

A Case of Food Poisoning of Unique Origin.—OHLMACHER, A. P. *American Journal of the Medical Sciences*, cxxiv, No. 1, p. 68, July, 1902.

This case of food poisoning occurred in the Ohio Hospital for Epileptics at a time when the resident population was 607. The illness was characterized by chills, cold hands and feet, aching limbs, severe headache, nausea and vomiting, pain in the abdomen, and a profuse watery diarrhea. There was fever, prostration, staggering gait, with heightened temperature, and increased action of the heart. The sickness was confined to 506 patients who ate in the central dining-room; the officers and employees in the cottages, with separate dining-rooms and kitchens, were not involved. This seemed to exclude milk, butter, vegetables, canned goods, and bread-stuffs, which were used in common throughout the institution. By a process of exclusion, suspicion finally rested upon the oatmeal used for breakfast. All the oatmeal for the patients' central dining-room was cooked in a large batch during the afternoon and the steam was turned off at six o'clock P.M. By nine or ten o'clock in the evening the temperature of the oatmeal had fallen to about 100. The oatmeal was warmed the following morning by turning on the steam for a short time.

No provision had been made for ventilating the kitchen, hence the steam collected on the ceiling, where it was soon contaminated by dust through the open windows. On the evening preceding the

illnesses in question, 600 square feet of plaster was knocked off from the ceiling, and new plaster laid. In the room were twenty gallons of partially cold oatmeal, which had been prepared for breakfast the next morning. The top of the steam table was covered with boards and a layer of rubber cloth. This protection served to keep out large masses of plaster, but did not prevent the sifting in of fine plaster dust, which filled the room in a cloud. At this time the temperature of the oatmeal was at about body heat and was largely maintained at this temperature during the night.

The food poisoning is attributed to the infection of the oatmeal with the bacteria-laden dust from the ceiling, the microörganisms multiplying in the oatmeal, as in a culture medium, and producing culture products.

Scrapings from an intact portion of the original ceiling were used to inoculate tubes of bouillon, which became diffusely cloudy and foul in odor within twenty-four hours. Plate cultures from the contaminated bouillon yielded in great number B. coli communis and proteus vulgaris.

Oatmeal, prepared for consumption in the usual manner, was inoculated with scrapings from the ceiling and incubated over night. An extract was prepared by the Stas-Otto method, which yielded a small quantity of a yellowish, oily fluid. A drop or two of this fluid produced a severe toxemia in cats. A batch of oatmeal uncontaminated with this dust was treated similarly and used as a control, but with negative results.

A Case of Exalgin Poisoning.—SIEFERT, O. *Wiener Klinische Wochenschrift*, 16th year, No. 26, p. 525, June 29, 1902.

A case of a woman 39 years of age is described who, for a headache, was given 0.5 gramme of exalgin. The first dose was given on the morning of the 18th of January. During the day she complained of palpitation. The next day but one a second dose was taken, which was followed by the same symptoms. On the following day there was pain in the head, and a second dose of 0.5 gramme was taken. This was followed by dizziness, scotoma, noises in the ears, and great anxiety. At this time the blue tint of the skin and of the mucous membranes was marked, especially of the hands and face. The pupils were dilated and the pulse 160. Stimulants, hot baths, and the ingestion of large quantities of water was followed by an improvement in the symptoms, which at the end of two days had disappeared. The blue color of the skin and mucous membranes was attributed to the formation of methemoglobin. The writer

gives a brief *résumé* of the literature of the cases of poisoning with this substance, none of which have resulted fatally, but quite a number have shown severe symptoms with relatively small doses, like his own case. It is suggested that in view of the fact that we have substances that are quite free from poisonous properties, and are even more efficient from a therapeutic standpoint, it would be wise if this substance was no longer prescribed.

The Commercial Value of Human Life.—LEIGHTON, M. D. *Popular Science Monthly*, vol. lix, No. 2, June, 1902, p. 120.

The writer has attempted to arrive at the monetary value of human life by an analysis of the verdicts of juries. He purposely rejects decisions in states in which the law allows punitive damages and those states which have set an arbitrary limit to the amount that may be recovered in any action for the death of a person. The process of exclusion left 147 cases. The decedents were all males and of all ages and from every class of society. All of the cases were passed upon by supreme courts or courts of appeal. An effort was made to ascertain the value of women's lives, but only six cases could be gathered which were satisfactory, and it was thought that this was too small a number to enable satisfactory conclusions to be drawn. A tabulation of the amounts, together with the age periods, shows that there is a rapid rise in value from early life until the age of puberty, after which the sum given remains stationary until twenty years of age, when there is a very rapid rise culminating at about thirty years of age. From this point there is a slow decline until fifty-five or sixty, when the descent becomes sharp.

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ORIGINAL ARTICLES.

THE DIAGNOSIS OF DIABETES MELLITUS AND THE URINARY FINDINGS IN THIS DISEASE.[1]

BY D. L. EDSALL, M.D.,

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Under ordinary circumstances, the diagnosis of diabetes mellitus is perfectly easy in cases that are at all severe. The symptoms are commonly such that the presence of this disease is at once suggested to any practitioner who is in the least open-minded, and the diagnosis is usually readily established by very simple methods of examination of the urine. It is not worth while to discuss cases of this kind, for the story told by the patient is generally such as to lead even a medical student who has never previously seen a case to examine the urine at once, and it is particularly in cases which have the classical symptoms that the examination of the urine presents no difficulties and quickly settles the question.

It is, however, well known that many cases of mild diabetes, especially when they occur in elderly, overfat persons, present none of the typical symptoms of the disease; and it is equally well established, although not so generally recognized, that the severe, "pure" type of the disease may be causing grave disturbance of nutrition, without producing any of those symptoms which immediately suggest the necessity for an examination of the urine, while on the other hand the patient is often either somewhat dense and unobservant of his symptoms, or has grown accustomed to these symptoms and says nothing about them. Excessive appetite and thirst, and polyuria, are symptoms which suggest the existence of diabetes to any one,

[1] A part of a symposium on diabetes, held at the meeting of the Philadelphia County Medical Society, April 9, 1902.

and are by many physicians looked upon as being practically constant accompaniments of the disease when it is of the severe type. That this is not necessarily true is, however, frequently demonstrated by clinical experience.

Of these symptoms, excessive appetite is most frequently absent. It is often not observed when the patient is especially depressed by any intercurrent illness, or by the diabetes itself; it is not uncommonly absent when the disease is not severe; and it is, of course, not present when the patient, either by chance or purposefully, provides himself with the proper amount of foods of the correct kind. The absence of marked polyuria is common, and at times so complete as to have given rise to a special name, diabetes decipiens, for those cases in which a marked glycosuria occurs without polyuria; and if polyuria is absent, excessive thirst will, as a rule, naturally be absent also, as the excessive desire for fluids is chiefly dependent upon the loss of water in the urine.

It is therefore not at all uncommon to meet cases in which one or all of these symptoms are absent, and in which, nevertheless, the disease is severe; and it is not less common to elicit no history of these symptoms when some or all of them are present. I have, for instance, under observation at present a man who when first seen complained merely of marked weakness and loss of weight. He was at that time passing from 150 to 200 ounces of urine in the twenty-four hours, and this contained about 5 per cent of sugar; the polyuria was such as to cause him to lose much sleep every night, through the disturbance resulting from the necessity for frequent micturition; he was, of course, drinking very excessive quantities of water; and he had an unusually large appetite, as certified to by the nurse. Nevertheless, until especially questioned about these matters, he said nothing about excessive appetite or thirst, or about the polyuria. He was intelligent, and recognized that these symptoms were present; but he had grown accustomed to them, and thought them of little consequence.

In cases, then, in which the classical symptoms of the disease are not elicited, the matter of chief moment is to recognize the importance of other symptoms or physical signs which are, in themselves, clearly suggestive of diabetes, and which demand an immediate examination of the urine. It is through overlooking these symptoms that most of our errors in diagnosis occur. In the severe type of diabetes there are two symptoms which are nearly always present, and when present are usually complained of in a way that is extremely suggestive. These are the emaciation and the pro-

nounced feeling of muscular weakness. The occurrence of emaciation in diabetes is not to be wondered at; patients suffering from this disease are often losing, through the glycosuria, half the amount of food that a normal person requires for his daily work; and if this is not replaced by an excessive amount of food of other kind, emaciation is inevitable. That muscular weakness should occur under such circumstances is also readily understood; but this weakness of the muscles in diabetes is not wholly explainable on the ground that the patient is being insufficiently nourished. It amounts, at times, almost to paresis; and more commonly than this, the patient exhibits a muscular weakness which is more marked than that seen in other diseases in which there is equally imperfect nutrition and equally excessive wasting of tissue. It is a weakness which is strongly suggestive of that which occurs in toxic states, or, even more markedly, of that seen in many diseases of the nervous system, and is probably due to a considerable degree to actual neuritis, or to the less severe effects produced upon the terminal nerves by the excess of sugar in the fluids of the body, possibly by other more directly toxic substances. This symptom is extremely striking, and is often a very impressive part of the patient's story. Several other symptoms are regularly described as being very suggestive. Among the most generally known is itching, particularly of the genitalia; in men, balanitis is also very frequent. Closely associated with the itching are furunculosis and the development of carbuncles. Certain eye symptoms are also extremely suggestive, particularly cataract and loss of accommodation, the latter often being a very early symptom, and one that at times has been the first sign of the disease observed. There are, further, some nervous symptoms which should always suggest the possibility of diabetes. Among these is persistent neuralgia, especially neuralgia of the sciatic nerve; particularly when this is bilateral. Signs of neuritis, without other evident explanation, absence of the knee-jerks, and signs suggesting locomotor ataxia, are also occasionally present in diabetes, and each of them has furnished the first suggestion of the presence of the disease. It is also important to examine the urine in all such cases with another idea in view, namely, that diabetes occasionally arises in cases of organic nervous disease. Another symptom referable to the nervous system, and one that has also been repeatedly the first suggestion of diabetes, is impotence. A condition of another sort which is frequently complained of and may be readily discovered, but which is not commonly recognized as being suggestive of dia-

betes, is marked gingivitis, which is often associated with pyorrhea alveolaris and necrosis of the teeth. This is present with very great frequency in diabetes; it is often complained of, and discovery of its presence should always suggest an examination of the urine.

Furthermore, an examination of the urine for sugar should always be undertaken in persons who are at all obese; in those who are of gouty families or who have gouty tendencies; and in those who have a family history of diabetes or are neurotic or who come of neurotic families, particularly if they exhibit any symptoms the cause of which is not clear; and it may, of course, be properly said that an examination of the urine for sugar is an essential part of a careful investigation of any case, especially if it is not readily understood.

When one's thoughts have been directed toward the possible presence of diabetes, all doubt is usually quickly cleared up by an examination of the urine. If, with the ordinary copper tests, a reddish-yellow or red precipitate, in considerable amount, is obtained before the specimen is actually boiled or when it has been boiled for decidedly less than a minute, there is, practically speaking, no question that abnormal quantities of sugar are present. The same is true of the bismuth test, which is almost as satisfactory as the copper test for rough clinical purposes. If, in testing, the specimen has been boiled as much as half a minute before reduction occurs, the result is questionable.

If these tests are persistently negative — particularly, in cases which are under suspicion, if they are repeatedly negative when the patient is taking large amounts of carbohydrate foods—this is sufficient to exclude the presence of diabetes.

The chief difficulties are met with in determining the nature of cases in which a doubtful reaction occurs, or in which a distinct reaction for sugar is obtained either only once or over a short period, and not subsequently. The latter cases will be discussed later. As to the former, it is well known to every one that in testing for sugar with copper solutions one frequently finds that the solution becomes of a somewhat dirty, greenish color, or it is largely decolorized; it grows yellowish or somewhat reddish in color, without the deposit of an actual precipitate; or a precipitate usually yellow in color does form, generally more slowly than when a frank reaction occurs, and often only after decided boiling or after adding considerable amounts of urine. Rather less commonly, one will find that after prolonged boiling the reaction apparently becomes suddenly distinctly positive, while testing without pro-

longed boiling gives only an indefinite reaction or none at all. It is generally known that uric acid and creatinin, both of which are normally present in the urine in considerable amounts, will, when present in decided excess, produce a reaction with copper. It is not so commonly known, however, that one of the most frequent causes of an apparently positive reaction for sugar is the presence of glycuronic acid compounds, the recognition of which by fairly simple procedures is comparatively easy—decidedly easier than the satisfactory determination that either of the other substances mentioned is present in excess.

When such reactions are obtained, there are several methods of determining whether sugar is present or not. In the first place, a distinct reaction for sugar may at times be obtained by diluting the urine, when the result with concentrated urine has been doubtful. Again, with the questionable reactions that are due to uric acid and creatinin in particular, the method suggested by Sir William Roberts, which I have often adopted with satisfaction, will generally clear up the question. One allows two or three ounces of urine to run repeatedly through animal charcoal which has been loosely packed in a funnel. As a rule, if the reaction was not due to sugar, all semblance of reaction will have disappeared from the urine; while if it was due to sugar, the result will be more definitely positive than it was before. Under ordinary circumstances this test is satisfactory; but if slight amounts of sugar are present, losses may occur in passing it through animal charcoal; hence only a positive final result is reliable. Further, glycuronic acid compounds are not gotten rid of by this method; and in case the reaction still remains doubtful, their presence must be looked for, and sugar excluded by other means.

The simplest, most definite, and most satisfactory methods of clearing up these questions are the use of the fermentation test and of the polarimeter, if the latter is at hand. If the fermentation test is positive, in connection with a positive copper test, there can be practically no question that the substance present is grape sugar or dextrose. This test is the simplest and surest at the service of the practitioner. It is absolutely essential, in carrying out a fermentation test, to acidulate and to use a control test at the same time, if only small quantities of sugar are present. Ammoniacal fermentation may produce gas, and commercial yeast often contains small amounts of fermentable sugar; further, after a few hours the growth of the yeast spores may cause fermentation of the bodies of the old yeast cells, and thus small amounts of gas may be formed. Much

quicker than the fermentation test, and usually quite as distinctive, is the use of the polariscope, if this instrument is available. The disturbing substances that may give rise to a suggestion of glucose reaction are usually levorotatory, if they influence rotation at all. If dextrorotatory, they are but weakly so, and are readily distinguishable from glucose in this way.

If, then, the copper test, and either fermentation or polariscopy, or both, give positive results, there can be no question that sugar is present. If the copper test is positive or doubtful, and the fermentation test is doubtful; if there is very slight dextrorotation, or none, or the polariscope is not available, the best method is to use the phenylhydrazin test. Usually the most satisfactory method of carrying this out is the old way—heating about one-third of a test-tubeful of urine with phenylhydrazin hydrochlorate and sodium acetate for about half an hour in a vessel containing boiling water. Twice the amount of phenylhydrazin hydrochlorate sufficient to cover the point of a knife-blade, and of sodium acetate three similar portions, should have been added and dissolved before placing the tube in the boiling water. After the heating the tube is placed in cold water. A precipitate soon appears, and this may be seen microscopically to consist of needle-like crystals, which are in large part arranged in bundles resembling wheat-sheaves. A still more distinctive method of carrying out this test is that of Fischer. Lead acetate is added to the urine, the mixture is filtered, ten drops of phenylhydrazin and of acetic acid are added to twenty cubic centimeters of the filtrate, and the test is then carried out as before with heating and cooling. This test is feared by many because of the time it takes and the apparatus necessary; in reality, however, the older method first mentioned takes very little actual working time—not more than five or ten minutes, usually—and the only apparatus necessary is a test-tube and a tin can or small tin pail in which water may be boiled over an alcohol lamp or gas-burner, or on a stove. The modifications of this test recently suggested by Neumann, Kowarski, and others are much more rapidly carried out, but cannot be considered wholly reliable. If positive results are obtained the question is settled, but Cipollina has shown, as was to be anticipated, that with these tests, and probably with his own modification (which he considers more reliable), crystals may not form for as long as an hour if only small amounts of sugar are present. Hence these modifications are of no great value in those cases that are actually troublesome—*i.e.*, in those in which only small amounts of sugar are present.

If, however, the phenylhydrazin test is positive to the extent that typical wheat-sheaf bundles of crystals are found, it is practically distinct proof of the presence of sugar. Stray crystals are not distinctive, nor is the mere presence of numerous crystals of non-characteristic form. This test is the most certain that we have. I confess, nevertheless, that I do not share the absolute faith in it commonly expressed, for it has been shown by Neuberg and others that after prolonged heating glycuronic acid forms suspicious looking, needle-like crystals with this procedure. These crystals may be recognized by determining their melting point, but this is entirely out of the question under ordinary circumstances. This objection is, however, of but slight importance, as the prolonged heating necessary to the formation of these crystals is usually sufficient of itself to exclude error from this source.

When, however, we have shown beyond reasonable doubt that sugar is present, we do not, as a usual thing, need to proceed further. If, on the other hand, we have a reaction to copper which closely resembles a dextrose reaction, and yet fermentation is negative, doubt is likely to cling to one's mind unless the nature of the substance causing the reaction is determined. A reaction to copper without fermentation is most frequently due to glycuronic acid compounds. It is usually these compounds that give a reaction after chloroform anesthesia and after the use of chloral, camphor, thymol and copaiba, and occasionally after that of morphine and other drugs; at times these compounds are also present during the course of infectious diseases, in neuroses, in gastrointestinal disturbance, and in diabetics when actual sugar has disappeared from the urine, in such excess as to give rise to a very suspicious reaction. As a rule, the copper reaction under such circumstances appears distinctly only when the test has been subjected to decided and prolonged boiling, this circumstance itself suggesting that the reducing substance may not be sugar. More distinctive than this is the fact that these compounds do not undergo fermentation. Their actual presence may be determined by the fact that they rotate polarized light to the left, as they are found in the urine; but that, after heating the urine with sulphuric acid (one or two per cent), glycuronic acid itself is set free, and this free glycuronic acid rotates to the right. Also, after heating with one-per-cent sulphuric acid and then with an orcin-HCl solution, a fairly characteristic color-change occurs, and a distinctive spectroscopic band may be found.

Rarely, pentoses (sugars containing five atoms of carbon) may be

present in the urine, and may give rise to decided confusion, since they freely reduce copper and also show dextrorotation; they do not ferment, however; they rotate relatively little, as compared with their powers of reducing Fehling's solution; and they give a red color and a characteristic spectroscopic band when warmed with hydrochloric acid and phloroglucin. They also give the orcin-HCl reaction without previous heating with acids. In the rare cases in which they occur without dextrose, it is important to recognize the nature of pentoses; for, in the absence of glucose, the case is of wholly different nature from one of ordinary glycosuria. The exact importance and significance of chronic pentosuria is not well determined, but the condition is certainly not actual diabetes.

Still more rarely, alkaptonuria may be the cause of error, since the homogentisic acid which is passed in this disorder reduces copper. This is comparatively easily distinguished, however, by the absence of fermentation; by the presence, or the ready development after standing, of deep pigmentation of the urine; by the fact that bismuth tests are almost or entirely negative; and by the appearance of a blue color on adding a small amount of ferric chloride solution.

The tests recommended by Bremer and Williamson for the diagnosis of diabetes by the examination of the blood I have used, although only rarely and without enthusiasm. It is almost certain that both of them depend upon the existence of hyperglycemia, and that they are therefore likely to occur only when the latter exists. Glycosuria, however, is practically always present when there is a notable degree of hyperglycemia. As a consequence of these two facts, it is highly probable that neither of these tests would be certainly positive if glycosuria were absent. Bremer claims that the contrary is true of his test, but his observations have not been supported by those of others. Of the two tests, Williamson's seems the more rational. It has been the experience of others, and it is wholly reasonable to expect, that Bremer's test occurs in other conditions than diabetes. Williamson's is certainly seen but rarely in any other disease, probably because the decolorizing of methylene blue in alkaline solutions practically never occurs at body temperature and in the body fluids except when excessive amounts of sugar are present. That the test is due to the excess of sugar has been made very probable by various experiments concerning the influence of sugar upon methylene blue, and by the curious observation of Assfalg that a patient who exhibited alimentary glycosuria, and who was given methylene blue at the same time, excreted the chromogen

in the manner that is customary to normal persons, while the dye itself was not excreted at all until a period when the urine was free from sugar. A similar observation was mentioned by Riesman in a discussion at a meeting of the Philadelphia Pathological Society a year ago. A patient with severe diabetes who was given methylene blue excreted none of the dye as such; while a man with a milder case of the disease did excrete the dye.

These tests seem to me to be of interest, but not of importance in actual diagnosis. Williamson's test might be of real value in doubtful cases of coma if urine could not be secured; but the other symptoms will probably be always of greater value.

As was said before in speaking of urinary tests, a frank reaction to copper when the test has not been actually boiled hard practically always means sugar; and if such a frank reaction occurs, or if a questionable reaction has been shown to be due to glucose, this by far most commonly means that diabetes is present. It is always, however, strongly advisable to postpone making an absolute diagnosis of diabetes until at least one test carried out at another time has also proved positive, and until the circumstances attending the case have been carefully inquired into. It may be worth while to repeat the old warning that, in private practice particularly, one must first be sure that the sugar was passed with the urine. It is, of course, well known, though not sufficiently well remembered, that persons who have hysteria or who are indulging in simulation occasionally introduce sugar into their urine, but patients at times unconsciously give rise to much bother and anxiety by bringing urine in bottles which have contained sugary solutions and have not been rinsed. I have repeatedly known this to be the cause of much worry. Aside from such occurrences, however, it is known to almost every one that glycosuria may appear temporarily, as the result of marked alcoholic excess or of either physical or emotional shock, sometimes after great excess in eating actual sugar, in rare instances as a consequence of poisoning of various kinds, and sometimes in the course of or during convalescence from acute infectious diseases. Under these circumstances, the glycosuria may follow any one of three courses: it may be extremely transient, or persist but a short time and then disappear permanently; it may soon decrease or disappear, and afterwards reappear; or it may remain persistently after its first appearance. In either of the latter two cases we have a diabetes; but in the former actual diabetes may never develop. Cases which give rise to the same diagnostic difficulty as those last mentioned, but which

are always decidedly more suspicious, are the instances in which, without any definite cause that can be determined, sugar is found once or perhaps on several occasions, and then disappears over a somewhat prolonged period of observation. It is always difficult to determine definitely whether diabetes is present in either of the above varieties of cases; or, more particularly, whether diabetes is about to develop. If there has been some such condition as severe shock, poisoning, or acute disease, and if the glycosuria is but transient and does not reappear for some weeks afterward on repeated testing, it generally will not do so at all; if, however, the glycosuria has appeared without any clear cause, but has definitely been shown to be present, it is almost always unsafe to state soon that diabetes will not subsequently appear. Probably the most satisfactory method of dealing with either of these varieties of cases is to place the patients on a diet which includes unusually large quantities of starches (not sugars), and to determine, after this diet has been persisted in for at least a week or two, whether it has caused a return of the glycosuria. If it has not, it is practically safe to say that the patient's powers of assimilating carbohydrates are normal; if it has returned, he should be classed as a very mild diabetic.

There can be but little question that cases of this kind—namely, of very brief, transitory glycosuria—are not so common as reports would indicate. I have no doubt that a large proportion of the reactions obtained under such circumstances and attributed to sugar are due to the presence of other reducing substances, probably chiefly glycuronic acid; and this statement is particularly likely to be to the point when the patient is under medication. A very considerable number of cases of this kind are shown by the reports to have been taking some such substance as chloral or camphor, the excretory products of which will cause decided reduction. The actual necessity for deciding as to the nature of such cases is therefore comparatively uncommon when tests are properly made. A much more common occurrence is, in elderly, fat persons particularly, to see glycosuria appear, disappear, and reappear repeatedly. Such cases, while of wholly different prognosis from essential progressive diabetes, and while very likely of distinctly different nature, must, in the present obscurity concerning the pathogenesis and nature of the disease, be classed as actual diabetes.

A further condition which deserves mention because it is not sufficiently generally recognized, though well known to obstetricians and students of nutritional disorders, is the lactosuria of pregnancy and lactation; for, unless this condition is recognized, it is likely to

be wrongly considered to be diabetes. The appearance of lactose in the urine of a pregnant or nursing woman has no known pathological significance, except incomplete emptying of the breasts or excessive secretion of milk, and it is not uncommon. It is wholly distinct from diabetes. Even the appearance of glucose may not mean diabetes, for glucose not infrequently appears at this period only to disappear after a short time without being accompanied by any constitutional disturbance. Indeed, Marie des Bouvrie has recently found very small amounts in four-tenths of all urines from pregnant women that she examined, the glycosuria disappearing almost immediately after the birth of the child. The presence of a notable amount of glucose is, however, a far graver matter than lactosuria, and actual diabetes not infrequently first appears during or soon after pregnancy.

There are still a few points to be spoken of in connection with the examination of the urine—chiefly those changes in the latter which are seen when coma is approaching or when it is actually present. These alterations are, from the clinician's standpoint, the appearance of acetone, in large amounts, and of diacetic acid. Acetone is normally present in the urine, but in amounts too small to respond to ordinary tests. In any severe case of diabetes, acetone will usually be found by ordinary tests. If the patient is on a strict or moderately strict diabetic diet, the reaction for acetone is frequently marked, even when there is no suggestion of coma and no immediate danger of it; indeed, a pronounced reaction for acetone may be found in the urine under a variety of circumstances, the chief factors associated with its occurrence being the ingestion of undue amounts of fatty or proteid food—especially of fats—with reduction of the carbohydrate food, a loss of body tissue, gastrointestinal disturbance, and various intoxications and infections. The presence of acetone alone, even in considerable quantities, is therefore not at all distinctive, either of diabetic coma or of anything relating to diabetes alone. In a case of actual diabetes, however, if acetone is present in large amounts and especially if the quantity tends to increase, this is sufficient warning that there is danger of the onset of coma, and is often a warning that it is advisable to alter the diet, and particularly to administer large doses of alkali.

The same statements may be made concerning diacetic acid that have been made with reference to acetone, in regard to its presence in other conditions than diabetes, although they must be more restricted. Diacetic acid occasionally appears in other diseases, its appearance being chiefly dependent upon the intensity of the intoxi-

cation. Under ordinary circumstances, the reaction for diacetic acid means that one will obtain a strong reaction for acetone, and it is looked upon as indicating that the intoxication is a severe one. More recent researches seem to indicate with considerable probability that all the acetone found in the urine is really passed as diacetic acid; if present in small amounts, the diacetic acid is almost at once completely oxidized to acetone, while if passed in large quantities, the diacetic acid is present longer in greater or lesser amounts. If this is the case, any conclusions to be drawn from the test for diacetic acid must be based upon an examination of very fresh urine, as otherwise the intensity of the reaction and even the occurrence of a positive reaction may vary greatly in accordance with the time that has elapsed since the urine was passed. Hence, even the occurrence of a diacetic acid reaction may perhaps not mean a very intense intoxication, if the urine is examined quite fresh; and we need to study this question more definitely from this standpoint before we can say absolutely that the mere presence of diacetic acid does mean grave intoxication. This view seems to be sustained by recent work, particularly that of Hesse, carried out with Lipliawski's method. This is much more delicate than the ferric chloride test, and, according to Hesse, reacts positively in almost all instances if marked reactions for acetone are obtained. As the test is usually carried out, however, with ferric chloride and with urine that is not fresh, if there is any notable amount of diacetic acid present, it certainly means that the intoxication is severe. It is unnecessary to give the tests for acetone and diacetic acid as they are to be found in any reference book.

It is to be remembered, however, that other substances may give a reaction with ferric chloride wholly similar to that produced by diacetic acid, and it is always best to carry out a control test with urine that has previously been boiled. In this specimen the diacetic acid will have been oxidized or driven off; and if a reaction, as intense as before, is still obtained, it indicates that other substances cause it. A more direct result may be obtained by testing the ethereal extract of urine that has been acidified with sulphuric acid. A ferric chloride reaction for diacetic acid in the ethereal extract directly indicates the presence of this acid.

These tests are the only ones which are ordinarily at the service of the clinician outside of hospitals or special laboratories. If more extensive apparatus is at hand, other more accurate and more distinctive tests of the approach of coma may be carried out. These are estimations of the beta-oxybutyric acid and the ammonia of the urine. Large amounts of beta-oxybutyric acid always indicate

severe acid intoxication, and hence denote danger of coma. This substance rotates polarized light to the left; its amount, therefore, may be roughly determined by finding the quantity of sugar indicated by titrating with Fehling's solution and the quantity determined by polarimetry. The latter result will be smaller than the former, and the difference between the two will roughly indicate the quantity of beta-oxybutyric acid. Still better, the test can be carried out by reading the polariscope before and after fermentation of the urine, and thus determining the quantity; or, best of all, by making a complete ethereal extract of the fermented urine and examining this with the polariscope.

The estimation of ammonia is exceedingly simple, if one has at hand some standardized alkali and acid solutions. The readiest method consists then merely in placing a definite quantity of the standardized sulphuric acid under a bell-jar, over a definite quantity of urine to which milk of lime has been added in excess, the bell-jar being placed over the solution immediately after adding the lime. The ammonia is set free and combines with the acid. After three or four days, the acid is titrated with alkali, and the amount of ammonia is calculated from the amount of acid neutralized by it. The ammonia should not reach two grammes per day. A decided increase over the normal quantity of ammonia indicates acid intoxication, and the intoxication varies directly with the amount of ammonia. The reason that this is true is the apparently well-established fact that under ordinary circumstances urea is largely formed by synthesis from ammonia. Normally a little ammonia (about 0.5 to 1 gramme) is passed as ammonia salts; this quantity is used, therefore, to neutralize the acids normally present in the system. If the acids in the system increase in quantity, more ammonia is, as far as is necessary, used by the system to neutralize the excess of acids, instead of going to produce urea; and this neutralization of acids with ammonia goes on in proportion to the amount of acid intoxication, as far as the system is capable of carrying on this process. Ultimately the acid intoxication grows so great that this method of antidoting it is insufficient; the fixed alkalies are then largely used for this purpose, the organism becomes supersaturated with acids, and the actual clinical evidences of intoxication appear and are likely to advance to coma. The estimation of the ammonia is therefore the readiest and most exact method, for clinical purposes, of determining the degree of acid intoxication. There is still another method—*i.e.*, balancing the acids and alkalies of the urine and determining the excess of the total alkalies—but this is too complicated for any purposes except those of research.

As to the changes in the urine other than those that are very directly a part of the diabetic disturbance: The urea is usually increased. If the patient is being properly dieted and is doing well this has no further interest than to be an indication of the fact that the patient is taking an abnormally large amount of nitrogenous food. When intoxication is very severe, however, the increase in urea may be partly due to actual excess of tissue destruction; and the same source may be found when the patient is taking too little food of the proper kind. The phosphates are likewise usually increased because of the excessive proteid diet, and a marked deposit of phosphates has given to one class of cases the name phosphatic diabetes. The sulphates, chlorides, and other inorganic salts are, like the phosphates, increased because of the diet; and they have, under ordinary circumstances, little interest. A rare occurrence is the passage of gas in the urine—so-called pneumaturia, apparently due to the fermentation of sugar in the bladder. Finally, a matter of some decided interest is the appearance of albumin and casts. The former is found in a large proportion of cases of diabetes in small amounts, accompanied at most by only a few casts, and unaccompanied even after years by dropsy or other evidence of nephritis. In these cases the albumin means nothing more than constant irritation of the kidneys, due to the persistent passage of large amounts of sugar, and to some extent also to the demands upon these organs in excreting the excessive amounts of other substances—urea, inorganic salts, etc.—almost always present because of the diet. Occasionally actual nephritis, with considerable quantities of albumin, notable numbers of casts, and with the other signs of nephritis, may occur, either in association with diabetes or as a complication of the disease. Under such circumstances it is not very uncommon to see the glycosuria diminish to some extent; and occasionally the diabetes has actually disappeared, and has been entirely replaced by a chronic nephritis. Diabetes occasionally terminates with actual uremia, although this is uncommon. It is of some interest because the terminal condition is then likely to be mistaken for true diabetic coma. One matter of a certain degree of importance is that casts have repeatedly been found in very large numbers during coma, and even for some time before its onset when previously absent; and certain authors believe that the examination for casts may be an important method of foreseeing the onset of coma. In a limited sense this is almost certainly true; that is, if casts appear suddenly and in large quantities, it strongly suggests the occurrence of coma; but they are not usually present, and the value of this method of observation is therefore a limited one.

SOME ASPECTS OF THE PRESENT SMALLPOX EPIDEMIC.

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In the general epidemic of smallpox which has spread over the country in the last three years, and still continues, there are peculiarities distinguishing it from previous epidemics. Conspicuous among these peculiarities are the atypical character of the eruption and the favorable termination of most cases. These features are responsible largely for its extensive spread and the large number of cases recorded, and existing but not recorded. Had the classical type prevailed, with its high rate of mortality and typical eruption and course of the disease, variola would have been more energetically dealt with, to the end that a perfectly preventable disease would have been exterminated early. Indeed, should the prevailing type persist, it will lead, it seems to me, to a modification of the laws and regulations governing the management of the disease from the point of view of public health, inasmuch as the basis of such regulations is and must be the reasonableness of the underlying spirit of the law. Taking the experience in the last year and a half in Dubuque, for instance—500 cases with but five deaths—it is difficult to persuade ourselves in the first instance, and impossible to persuade the public in the second, that a disease which in the vast majority of cases has a speedy and favorable termination, often, too, with slight or no visible reminders of the disease, is a serious matter, requiring that the many persons necessarily involved should undergo the hardships of quarantine. More particularly was this true before the last legislature extended to all persons, not merely paupers, in quarantine means of subsistence during the period of quarantine. This is really an important step in advance for public medicine in Iowa. Heretofore the situation has been that upon the outbreak of a case of variola the entire household has been quarantined, and yet unless the family previous to the establishment of quarantine had been legally paupers they were not entitled to aid, even though for the time being quarantine made them in fact paupers. The injustice of this condition of affairs was recognized after much unpleasantness for all concerned, and aid was rendered in most instances.

The origin of this epidemic appears to be contagium introduced into the United States from Spanish countries, Porto Rico, Cuba, and the Philippines, by returning soldiers and merchandise. In these countries the disease is not usually severe, and in consequence is lightly regarded, being in fact held in the same light that we hold

measles and chicken-pox. It was not uncommon in the "old days" in Manila to sit on the same seat in a street-car with smallpox patients. Mothers purposely exposed children that they might have the disease and be done with it.

Whatever the source, it is clear that this country, and particularly the Central States, were in fine condition for the development of the disease in an epidemic form, by reason of the long period in which nothing had arisen to cause a general vaccination.

In the past two years in Dubuque we have had, counting the reported cases and estimating the unreported and unrecognized cases, probably 500 cases of variola. The mortality total is five, making the per cent probably one. It will be seen from this that variola, as we have had it, takes rank with the very benign diseases, so far as life is concerned. There has been, however, a fair number of cases that suffered with complications, more especially of the eyes, as well as the majority who have met with cosmetic disaster to the exposed skin surfaces.

In regard to age, all periods from intra-uterine to old age have been represented, the oldest being 73 years old. In this connection two of the cases are interesting. In one instance a baby was born of a variola patient and bore well developed lesions of the disease, and both mother and babe made a good recovery. In the other instance a mother recently protected by successful vaccination gave birth at term to a healthy baby. In the family, and not isolated by force of circumstances, were five cases of variola in various stages of the disease, yet the baby did not contract the disorder.

In regard to the contagiousness of the different stages of the disease, the stage of desquamation is considered the most contagious, yet the disease is contagious in the earlier stages, as is shown by the following cases:

Case 1 entered one of our general hospitals and came down with the disease, and was removed before the period of pustule formation —more exactly the fifth day. Disinfection with formaldehyde was done in the usual way. Ten days after removal of Case 1, the second case, which had been in the hospital when Case 1 entered, came down with the disease, and was removed on the fifth day of the symptoms referable to variola. Again disinfection was done and the hospital quarantined for two weeks. Three days after quarantine had been raised, Case 3, who had gone home, came down with the disease in a moderately severe form. At the time of release from quarantine Case 3 professed to feel perfectly well, but

later confessed to have had at the time the general premonitory symptoms, such as slight headache, malaise, etc. Ordinarily, and in fact with one exception and the experience with Case 3 just recorded, the quarantine period of fourteen days after the last exposure was satisfactory, although the period of incubation may in some cases extend beyond this limit.

The pathology of the lesions in this epidemic seems to me to be atypical and to have been responsible for some errors of diagnosis. The classical lesion of variola is described as a multilocular suppurating process, having at first a hard, indurated feel in the papular stage, later becoming vesicular with a broad base and thick covering. In the center occurs an area of coagulation necrosis, giving rise to the appearance called umbilication. As suppuration goes on the umbilication ceases, giving way to a fully developed dome-shaped pustule. Commonly the typical lesion of variola invades the true skin or corium, and in this event invariably leaves a scar. The lesions in the present epidemic often lacked the characteristic shotty induration, the umbilication, the thick covering, and upon puncture presented a unilocular cavity, and finally healed without scar or pit. In view of these peculiarities the differential diagnosis from varicella could not be based on the lesions alone, and rested mainly on the clinical history of the case, especially the age of the patient, the presence of an epidemic of variola, absence of evidence of successful vaccination, and the distribution of the lesions. In many cases, too, the lesions at the height of the disease clinically remained rudimentary, and absorption took place before the pustular stage. In some very mild cases a half-dozen to a dozen lesions of this character made up the entire eruption, distributed on the forehead, wrists, and hands.

In general, the distribution of the lesions followed the rule, being more numerous on the exposed parts—forehead, hands, and wrists—than on the covered surfaces of the skin. Many cases which were well marked confluent cases on the exposed parts, were distinctly discrete on the covered. Besides the skin, the tongue, buccal mucous membranes, pharynx, epiglottis, and larynx exhibited the lesions.

In three cases marked lymphatic enlargements occurred during the latter part of the pustular and early part of the desquamation stages, and became a conspicuous feature of the cases; in fact, operative treatment was entertained, but proved unnecessary. The swelling lasted four to seven days, and disappeared with rest and local applications. All the important superficial aggregations of

lymph glands were represented, viz., occipital, saphenous, popliteal, inguinal, cervical, and axillary.

During the period of desquamation, furunculosis occurred in several cases, and was most marked on the lower extremities. The lesions averaged in size that of a nickel to a half-dollar, and extended inward to the deep fascia in some cases. The condition was reduced by incision.

No bacteriological work was done, and so far none of the reported specific organism has stood the tests of causal relation.

The symptoms of variola in the present epidemic vary greatly both in number and severity, and frequently have been out of proportion to the subsequent course of the disease and the eruption. Some cases starting in with mild initial symptoms have developed an abundant eruption, others with violent initial symptoms have had a discrete eruption. The most constant and conspicuous symptoms have been headache, nausea and vomiting, backache, and pain in the limbs, together with the usual febrile reaction. In some cases the period of invasion has been accompanied by a scarlatinal rash, some with a macular or measly rash with or without petechiæ. After three to five days, usually the fourth of the symptoms, the eruption begins to appear, first, as is well known, on the forehead, at the margin of the hair, then rapidly extends over the rest of the body, particularly on the exposed parts. At the same time, or sometimes a little before, the mucous membranes will present the eruption. With the advent of the eruption, the general symptoms or first fever of the laity subsides, and the patient feels relatively well again, but with the mucous membrane involvement begin the dysphagia, salivation, hoarseness even to aphonia, also dyspnea, and cough in severe cases. At this time, too, the skin and conjunctivæ, both palpebral and bulbar, begin to swell, leading often to complete closure of the eyelids. As the process goes on, the forehead, nose, cheeks, and chin become massive, so that the natural folds are obliterated. The lips become thick and stiff. At the height of this stage the face is a great round doughy mass, red, mottled, and uneven, having lost all resemblance to the human face in general and the patient's in particular.

The lesions develop steadily, first as shotty papules, then as vesicles with or without umbilication, attaining in some cases to the size of a quarter of an inch in diameter. The size of the lesions showed very great variations, and in a general way the largest variety was associated with relatively milder symptoms. The lesions are often discrete in the beginning, and as the process goes on they become

confluent in the pustular stage. From the eighth to the tenth day of the symptoms the fever of suppuration, or "second fever" of the laity, is at its height, after which, in favorable cases, convalescence begins, with a lowering of the temperature and drying of the lesions. The same order is preserved in the desquamation that obtained in the efflorescence—*i.e.*, the first to come are the first to go. In unfavorable cases death takes place from the eleventh to the thirteenth day, from exhaustion and septic intoxication. The pulse becomes rapid, feeble, and irregular; the sensorium becomes cloudy; delirium sets in and may be severe; subsultus and sometimes diarrhea occur; and finally coma and death. During the height of the disease dysphagia and dyspnea, together with the restlessness of the patient, make alimentation of any kind difficult, and this accounts partly for the exhaustion. A patient at this stage is perfectly helpless, and lies a great swollen, discolored hulk of suppurating flesh, distorted beyond recognition. Later on a cadaver-like odor, due to the crusting, taxes one to the utmost to render even necessary attendance to the patient.

The palms and soles are particularly painful, as the tenseness of the thickened epidermis increases greatly the tension in the lesions. Elsewhere the discomfort is that of itching and burning, and this may be largely relieved by local applications, so that physical restraint is rarely indicated.

The change in the first week of convalescence is marked both subjectively and objectively, and afterward is very tedious, as the skin is relatively slow in cleaning up the last bits of crusts and becoming perfectly smooth again. The rule for raising the quarantine adopted here was that the skin should be perfectly smooth and soft, whereby was meant that no loose particle of skin at or about the lesions was to be seen anywhere. By the aid of soap, water, and a brush applied thoroughly several times daily for the last week this period was often shortened by several days. The time thus spent in quarantine after the acute symptoms had subsided was well spent in recuperating after so exhausting an illness, and even the most ambitious patients found that for some time after release they were unable to do a day's work. The soles and palms are particularly slow in healing, while the covered parts rapidly become smooth and soft. A common and distressing symptom which yielded ill to treatment was insomnia, associated with the height of the disease. This lasted frequently two or three nights in spite of drugs, and was followed by a long, natural sleep, after which the patients began visibly to improve.

Several complications have occurred among my cases, and in some instances were of the first importance. Of these, laryngitis with edema of the glottis threatened the lives of several patients, and in one case was very severe. Besides edema of the glottis, necrosis of the cartilage and inhalation pneumonia from loss of reflexes of the larynx may cause a fatal result in laryngitis. Bronchopneumonia, both central and peripheral, occurred in one fatal case, associated with other complications. Pleurisy, frequent in some epidemics, occurred in but one case, viz., the one having bronchopneumonia.

Furunculosis, as already mentioned, was present in several cases, and was confined principally to the lower extremities.

Arthritis of both knee-joints, lasting several days, was conspicuous in one case during the stage of desquamation.

Endocarditis of the tricuspid valve and adjacent portion of the right auricle was discovered at autopsy in one case. Notwithstanding repeated examinations during life, this condition was not recognized.

Double otitis media was suspected in one case, but failed to give sufficient evidence during life to warrant a positive diagnosis, and at autopsy the ears were not opened.

Eye complications were fairly common, and many cases quite benign as to life suffered permanent damage to the eyes. The structures particularly liable to suffer are those springing embryologically from the entoderm, such as the conjunctivæ and cornea. Conjunctivitis is very common, and with care from the start is not often serious. Where, however, the lids are allowed to adhere, there is danger of diffuse keratitis. Pericorneal ulcers, particularly of the lower and lateral segments, have frequently been met with. In some cases permanent damage resulted, but perforation occurred in none of the cases. In one fatal case a curious condition of the eyes was present during the last week of life. Subconjunctival edema, both palpebral and bulbar, set in and developed to such an extent as to prevent closure of the lids, and gave the eyeball the appearance of a volcano with the cornea as the crater. Vision was reduced to light perception only. It did not respond to local applications, and in view of the negative findings both ante and post mortem in the kidney I am at a loss to account for it, as were the oculists who saw the case with me. Albumin was absent, and beyond cloudy swelling the kidneys were normal.

One well marked case of iritis occurred and made a good recovery.

In view of the benign character of the present epidemic and the self-limited course of the disease and its symptomatic treatment, the diagnosis of variola is principally important from the point of view of public health and the natural interest in making a definite diagnosis in a doubtful case, particularly as it often happened that the mildest cases were the source of contagion for very severe cases.

In the presence of an epidemic and the conspicuous symptoms already mentioned, there is little trouble in making a diagnosis. It is the first case in the beginning of an epidemic, and later the mild and atypical ones, that puzzle. The atypical character of the eruption so common in our cases made one look about for surer guides, and these it seems to me are the presence of evidence of successful vaccination, and the orderly sequence of symptoms.

A differential diagnosis must often be made in some cases from several diseases.

Scarlet fever is differentiated in those cases having a scarlatinal rash during the prodromal stage by the absence at this stage in variola of the irritation of the mucous membrane of the throat, and the difference in distribution of the rash as already mentioned. Once the papules have appeared all doubt vanishes.

Measles has the distinct symptoms referable to the respiratory tract early, while these symptoms in variola come later with the development of the pustule. The measly rash in variola is further distinguished by its distribution in the natural folds and flexor surfaces instead of the face, and is promptly followed by papules. Mistakes occur, however, and a measles patient was sent to me at the hospital as a case of variola.

Syphilis both in macular and pustular stage has caused trouble, and a case of pustular syphilis was at the height of the epidemic sent to the hospital as variola. Fortunately both this and the measles case had been successfully vaccinated, and no harm came on account of the exposure. In syphilis the history of the case, absence of severe symptoms and high fever, together with character of the eruption, should leave one in doubt but a moment.

Severe cases of variola, particularly in children, may be taken for cerebrospinal meningitis, but in spite of purpuric symptoms the shotty papules will soon settle the matter.

Acne may be ruled out by the absence of subjective symptoms commensurable with an eruption which would arouse suspicion.

Varicella has by all odds given rise to the greatest confusion in the mild cases of variola, not to mention Cuban itch and kindred

loose terms, which mean really nothing. In view of this confusion with varicella, I shall try to discriminate between the two in the light of recent observations. At the outset it is safe in the presence of this epidemic to adopt as practically true the proposition that "adults don't have chicken-pox," and in children chicken-pox has reached the crust stage before the eruption in variola has fully developed. Hence changes from day to day in varicella must be appreciably rapid. Further, successful vaccination has no influence in varicella, while in our cases variola did not occur in persons exhibiting evidence of vaccination, and in those vaccinated early in the disease the course was distinctly modified. In some of the latter cases the whole number of lesions did not exceed a dozen, and the patients were several days further advanced in convalescence than those who were the source of contagion for them.

More specifically the differences are: (1) The period of incubation is shorter in varicella; this is two to three weeks, while in variola it is one to two weeks. (2) In the prodromal stage the symptoms last one to two days and are mild, while in variola they last three to five days and are severe—*i.e.*, chill, headache, nausea and vomiting, backache, etc. (3) In the stage of efflorescence the lesions of varicella are superficial, becoming vesicular in twenty-four to thirty-six hours, usually not umbilicated; the vesicles are soft, unilocular, collapse on puncture, are irregular in distribution, being more numerous on the covered than the exposed parts, and come in successive crops; further, they vary in size and often don't go on to pustule formation. In variola on the other hand the lesions are subcutaneous, indurated, and shotty. Systematic development of macule, papule, umbilicated vesicle, pustule, and crust, all in one crop. The lesion is multilocular, and collapses only partially on puncture. The distribution is pretty constant on exposed surfaces, and regular—*i.e.*, head, wrists, soles, and palms. The lesions are uniform in size in the same individual. (4) In varicella when crusting occurs, it is lighter and more superficial, while in variola there is marked crust formation with scarring. (5) The duration of varicella is seven to ten days, while variola lasts twenty-one to twenty-eight days and even longer. (6) The temperature in varicella is irregular and not high, while that of variola is constant, high, and lasts longer. It rises suddenly and remains three to five days, until the eruption occurs, when it subsides; then it rises again during the pustular stage, and again lasts four to five days.

In view of the statistics given above, it will be seen that the present epidemic is a benign one as to life. The principal considera-

tion as to prognosis is the severity of the eruption as it appears on the face and hands—*i.e.*, discrete or confluent. The fatal cases in adults were confluent ones. Age is important, as the disease is particularly fatal in children, and of the five deaths here, three were children. In cases having a continuously high or rising temperature with the appearance of the eruption the outlook is bad. Likewise delirium and subsultus augur ill for recovery. Severe laryngitis and pharyngitis have a grave prognosis. Pregnancy is a serious complication for the mother, and usually, though not always, leads to miscarriage. In one case the patient went to term and gave birth to a living child, as mentioned above. In another case reported to me, confinement resulted in death to both mother and baby.

The best treatment is prevention, and in view of the fact that in vaccination we have the only specific and perfectly safe preventive susceptible of universal application known to medicine, and further, in view of its vast benefits to mankind in the past, it is certainly one of the saddest commentaries on the state of civilization which we exhibit that variola should exist at all among us, and worse still be allowed to attain to such proportions as is represented by 500 cases in a community of this size. Furthermore, the showing made here is not as bad as has been made in a number of other places. The remedy it seems to me must be sought in the education of public sentiment, for as a general proposition in a representative government as we have it, the representatives are not leaders but merely spokesmen for certain groups of constituents, and unless they feel that a majority of said constituents are really interested in a movement, the attitude is one of expectancy. In dealing with an epidemic, we have many of the features which exist in military operations. The good of the individual must be sacrificed for that of the majority, and delays and compromises are often fatal to good results in public health work.

Given variola, however, the treatment is symptomatic, as for any acute self-limited contagious disease. Cleanliness is especially important, to reduce to a minimum the natural filth of the disease process, while the sponging has a beneficial influence in controlling temperature. The old firmly rooted idea of overheating smallpox patients should be combated. The severe initial pain in the back may require opium, and this may be freely given; liquid diet for the periods of pyrexia, and later an abundance of easily digested nourishing food. For the skin lesions the best preparation, it seems to me, after trying many, is a combination of glycerin, car-

bolic acid, and oil, in proportions of ʒ iij, ʒ j, and Oj respectively, or modified to suit the individual. This controls the itching and burning as well as anything, and keeps the skin soft during the crust stage. Later, warm water, soap, and a brush applied once or twice a day will hasten desquamation and save several days in preparing the patient to pass muster for release from quarantine.

As a routine measure where the conjunctivæ are at all involved, it is well to drop in the eyes a four-per-cent solution of boracic acid several times daily, and if the lids show any tendency to adhere, the margins should be anointed with any simple preparation. The mouth, throat, and nose should be kept clean.

For the delirium and mania, cool sponging should first be tried before employing drugs. For hemorrhage drugs are useless. Tracheotomy may become necessary for edema of the glottis.

During convalescence it is important to give a tonic, and cod-liver oil was found to do well in building the patients up. This, with regulating the bowels, fresh air, and good food answered the purpose. It was a constant source of surprise to see the amount of food these patients could take care of.

There is no known way of preventing pitting unless it be by phototherapy, of which more below. All one can do is to protect the skin from artificial injury.

Recently phototherapy has been applied abroad to the treatment of variola with success. Finsen of Copenhagen, in 1893, advocated its application to smallpox, and since then many foreign observers have used it. The principle of the treatment rests on the fact that the chemical rays of light—blue, violet, and ultra-violet rays—exert an injurious influence on healthy skin, and very naturally on diseased skin a greater injury; and further, the exposed skin surfaces present the deepest and most confluent scars. It was a common observation in our cases to find even in the severest confluent cases with abundant scars on the exposed parts perfectly smooth skin on the covered parts. The claims for the method are that it checks or aborts the formation of pustules, hence the fever of suppuration is eliminated and scars are prevented.

Without going into the theoretical considerations leading up to its application, the technique consists in eliminating the chemical rays of white light by filtering it through a red medium, and Finsen's rules[1] are as follows:

1. "The exclusion of the chemical rays must be absolute. The thickness of the red material employed to filter the light depends

[1] Prof. Niels R. Finsen: Phototherapy, the Chemical Rays of Light, and Smallpox.

upon its nature. If paper or thin cotton material is used, four to five layers will suffice. It is more convenient to employ red glass, but in that case the glass must be very dark. To put it in another way, smallpox patients must be protected from the chemical rays with as much care as the photographer uses for his plates and paper. For artificial light neither electric light nor any too brilliant illuminant must be used. The globes and lamp-glasses should be of a very dark red. A candle is permissible on account of its feeble illuminating power. It may be used to examine the patient and give light while he is having his meals."

2. "The treatment should be continued without the least interruption until the vesicles have completely dried up. Even a short exposure to daylight may produce suppuration, with its sequels. It is therefore absolutely necessary to nail up the curtains, to prevent the patients and nurses from allowing the light to penetrate, for it has been found that these people tire of being in the semi-darkness, let in the light, and so reduce to naught the good results hoped for from the treatment."

3. "The treatment must be commenced as soon as possible after the appearance of the rash; the nearer one gets to the suppurative period, the less chance there is of a good result."

4. "It must be understood that death from smallpox will not be prevented by this treatment, especially before the suppurative period."

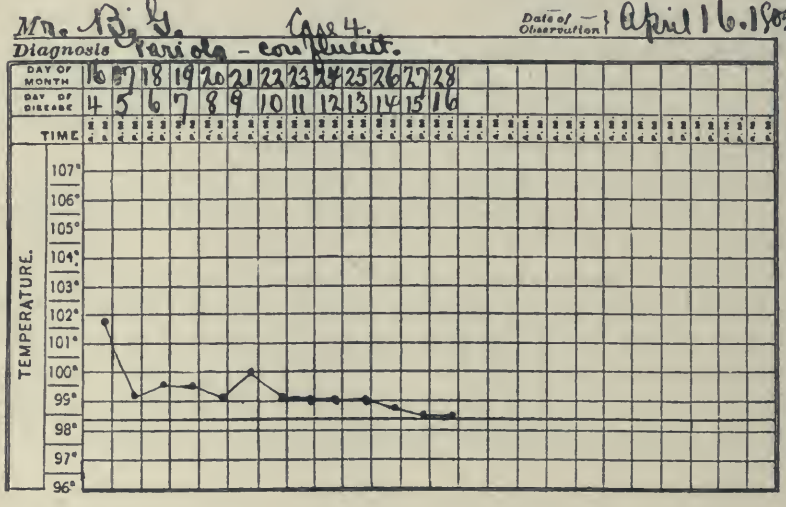
5. "If the patients are subjected in time to this treatment, and if the rules stated above are followed out, suppuration will generally not occur, and the patients will recover without scars, or only with almost invisible cicatrices. It is to be noted that during six to eight weeks the skin remains covered with hyperemic or pigmented spots; at the end of this time, however, they finally disappear."

In our smallpox hospital last winter I had the windows and transoms of several rooms covered with five to seven thicknesses of red paper. It was impossible to begin the treatment earlier in the season because the arrangement was such that with a full hospital it would have meant to keep all patients, those in the acute stage and the convalescents alike, in semi-darkness. A candle or covered lantern was allowed at meal-time, and when it was necessary to attend the patients otherwise.

Finsen gives reports of 140 odd cases of his own and other qualified observers abroad in which this method was found efficient. The temperature charts are given in four, and from them it is clear

that the fever suppuration is absent, and the notes testify to the beneficial results in regard to pitting.

Four cases were treated here in this way. Of these only one entered the fourth day of the disease, or before suppuration began, while two entered the seventh and one the eighth day. Thus three entered when the vesicles were fully developed and suppuration had begun. All three had the confluent type. Of these, one died the thirteenth day with severe pharyngeal symptoms. The other two, although apparently as ill as the one who died, except for the pharyngeal complication, began after two to three days in the red room to improve, and seemed to gain several days in progress of recovery over similar cases not treated in this way. The fourth case entering the fourth day of the disease with a moderately severe confluent type was far more comfortable than the others, and as will be seen by the temperature record escaped the



fever of suppuration. His convalescence was rapid, especially considering that he was sixty odd years old. In all the cases, except the one who died, the cosmetic results were eminently satisfactory. In Case 4 there were no visible scars, and in the other two the scars were vastly fewer and more superficial than in like cases not so treated.

Inasmuch as this treatment is simple and easily applied, and further is not a substitute for other treatment, but rather an added aid, it seems to me from the published reports and my own experience to be well worth more general and careful application.

TUBERCULOSIS OF THE TESTICLE AND EPIDIDYMIS.*

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Tubercular infection of the male genito-urinary tract constitutes one of the most frequent infections of this part with which we have to deal, probably second only to gonorrhea; and a review of the literature, particularly that pertaining to the testicle and epididymis, reveals widely discrepant views and many conflicting experiences.

Turning for a moment to the pathology, a knowledge of which is essential for the application of correct treatment, we are impressed with the diversity of views upon several points, expressed by men whose prominence commands respect for their opinions. That the process in the testicle is ever primary is denied by most writers; others regard it as of such rare occurrence as to pass it with a simple mention. That the process in the epididymis is often primary we find asserted by such men as Senn, Councilman, Reclus, Murphy, Saleron, and other investigators; while Virchow, Koenig, and Kocher have always held that the infection is a descending one.

Councilman[1] states his belief that the most common seat of primary urogenital tuberculosis is the epididymis, as follows: "It may be confined to this, or the testicle affected by continuity. The epididymis is converted into a more or less firm, caseous mass. From this the disease extends along the vas deferens, which becomes enlarged, and on section the interior is found to be lined with a whitish caseous tissue. In both the vas deferens and the epididymis the seat of the disease is primarily the epithelium, and later takes the form of a tubercular inflammation. Seminal vesicles on the same side become affected in most cases, or they may be passed by and the disease appear in the prostate or bladder."

Fuller[2] says: "It is rare for the tubercular deposit in the epididymis to represent a primary focus of the disease, as in a vast majority of cases the inflammation has extended to the part along the genital tract from the deep urethra or seminal vesicle. In many instances I have watched the process of extension, having detected the tubercular involvement of the deep urethra or seminal vesicle long before the disease had extended itself into the epididymis." In these views Guyon and Lancereaux concur.

The points of entrance of the bacilli are conceded by all to be the skin, respiratory, gastrointestinal, and genito-urinary tracts, the

*Read before the Kentucky State Medical Society at Paducah, Ky., May, 1902.

localization in the epididymis then depending on one or more of several conditions. Among the various influences operating to determine the localization of tubercle bacilli in the epididymis may be mentioned heredity; that is, the local predisposition may be inherited or the disease may be congenital, as in the cases of Giraldes and Dreschfeld (*British Medical Journal*, 1884), in which the testicle was tubercular at birth.

M. Julien reports sixteen cases in infants, six of which were in patients less than one year old. Injuries, particularly slight and insignificant ones, by lessening local resistance, may afford a nidus for deposition of germs. Simmonds experimentally demonstrated this by injecting tubercular sputum into the peritoneal cavities of rabbits and afterward crushing or bruising the testicle, tuberculosis following the subsidence of the orchitis.

Severe injuries are rarely followed by tuberculosis, since, according to Volkmann, the active changes set up in a tissue during its repair following such an injury counteract the propagation of the bacilli.

Antecedent or coexisting disease of the testicle, particularly gonorrheal epididymitis, may be a factor. In fifty-two cases collected by Kocher and sixty by Simmonds, fourteen of Kocher's and eleven of Simmonds's had previously suffered from gonorrhea.

Senn states that gonorrheal epididymitis at times imparts a malignant character to the tubercular process, and quotes the following case of Birch-Hirschfeld, a soldier with gonorrheal epididymitis, who died in eight days from a diffuse miliary tuberculosis having its apparent point of origin in the gonorrheal epididymis.

Jani has found bacilli in healthy testicles of phthisical patients, and Koenig thinks that in these cases a gonorrheal epididymitis would serve to prepare the ground or culture medium for an already existing infection.

Another cause advanced by Saltzmann for localization is that the branches of the spermatic artery to the epididymis are tortuous, consequently slowing the blood-current, favoring bacterial growth; in descending infections the epididymis would naturally be involved before the testicle.

Another method of infection, the possibility of which can readily be seen, and which is advocated by M. Verneuil, is by coitus. The instances, however, of primary tuberculosis of the testicle or epididymis with infection occurring during coitus must be rare, although the disease occurs most frequently at a time when the generative system is at its highest state of physiological activity,

and that is between the ages of twenty and thirty years, although no age is exempt.

The most potent source of tubercle bacilli in the blood is believed to be the mediastinal lymph glands, which have been shown to be tubercular in 75 per cent of cases coming to the post-mortem table. The situation of the primary nodule has been and is the subject of dispute. Reclus and Malassey locate it in the wall of the seminal tubule; Virchow, Gaule, and Steiner in the intercanalicular connective tissue; while Langhans, Curling, and others locate it in the interior of the tubule itself.

Reclus[3] was able to remove the nodules when he resected portions of the seminal ducts, thus showing their connection with the ducts. He believes the process to originate in the endothelial envelopes of the tubules, the lumen being secondarily affected.

Murphy, in a recent article, supports the view of Virchow and others by saying: "As in the majority of cases the infection probably takes place through the blood-current, it seems reasonable to suppose that the primary lodgment of the bacilli is in the intertubular connective tissue of the epididymis, and this view is certainly supported by studies of tuberculosis in other organs."

Curling, in his work on diseases of the testes, expresses the opinion that the point of origin is in the interior of the tubule, and continuing says: "Anatomic considerations, indeed, support the opinion that abnormal nutrition in the cellular contents of the tubes includes the formation of miliary tubercles in the walls without at all negativing the development of tubercle in the intertubular tissue, as seen by Virchow, or in the adventitia of the blood-vessels, as observed by Nepveau. Indeed, the discrepant views upon the matter may be explained by assuming that different observers have regarded what has been found in particular cases as the result of some general law. With reference to this the suggestion of Klebs is valuable. Admitting that in acute miliary tuberculosis, where the dissemination of the virus is effected by the vascular system, the blood-vessels and their surroundings are the seat of tubercles, he has seen preparations from Langhans where the tubercles were in the interior of the tubules, and Klebs adds that 'it would be very desirable to ascertain whether this was uniformly the case in the so frequent extension of tuberculosis from the older nodules in the epididymis to the testes.'"

But let the starting be at either of the three mentioned places, the tubercular process itself does not differ here from tubercular processes elsewhere, but consists of deposit, caseation, and liquefac-

tion, calcification being rarely observed. The tunica vaginalis usually shows evidence of chronic trouble, is unnaturally vascular, its cavity wholly or partially obliterated, or may contain fluid which may be serous, seropurulent, or pus, tubercle bacilli having been found in all three varieties. Simon examined twelve tubercular testicles and found evidence of involvement in eight.

M. Tuffier[4] found that the liquid of hydroceles present in three cases of tubercular testes injected into the cavities of animals produced fatal tuberculosis, although no tubercle bacilli could be demonstrated in the fluid. The vas deferens is commonly involved, becoming hard, knotty, and thickened, rendering it more or less irregular with nodules. The lesions are found particularly near the testicle and near the seminal vesicle. The involvement of the testicle is nearly always secondary to that of the epididymis; the epididymis is most frequently attacked in the globus major, although the observations of some few have been that the globus minor is first affected. Jacobson suggests that those cases in which the globus major is first affected are the primary ones, as the spot of involvement usually corresponds to the entrance of the branch of the spermatic artery, while those in which the tail is attacked first are secondary to other urogenital lesions, the infection descending from the urethra or seminal vesicles through the vas deferens.

Murphy, in the November Practical Medicine Series, says: "Baumgarten experimented on rabbits to determine the manner in which urogenital tuberculosis is disseminated. Inoculation of the urethra never produced a tuberculosis of the testicle, but always developed a tuberculous ulcer of the posterior urethra, and often of the fundus of the bladder and the prostate; it never extended along the ureter to the kidney. If, however, the epididymis was inoculated, tuberculosis of the vas and prostate of same side always resulted; it never spread to the opposite side. The results of these experiments are in harmony with the rule pertaining to all cases of experimental tuberculosis: tubercle bacilli never spread in a direction opposite to the current (against the stream), whether it be blood, lymph, or a secretion stream. The explanation of this is found in the fact that tubercle bacilli are non-motile and do not multiply in normal secretions. To infect, these bacilli must enter the channel wall; from here, through ulceration of the channel wall, they again reach the secretion, thus spreading the infection only in the direction of its flow. The infection is also disseminated by the lymph vessels within the wall, but this lymphogenous infection is also carried from the epididymis along the vas to the seminal

vesicles and prostate. The results of these experiments agree with the findings in autopsies. The conditions for the spread of the tuberculous process are the same in man as in the rabbit, because the anatomic relations are essentially the same. He confirms the opinion of von Bruns, that tuberculosis of the testicle is the only localization possible in the urogenital tract; and this view is sustained by the conformity in results obtained by clinical experience, pathologic investigation, and experimental research."

After noting how widely divided the profession appears to be in regard to the pathology and dissemination of this tubercular process, we are not unprepared for the various radical and conservative measures advocated for its relief; among the advocates of the radical operation (castration) are Kocher, von Bruns, Simon, and others.

Young[5] quotes Koenig's report of Kocher's forty-five cases as follows: "Kocher does not favor the partial operation, and in this series has performed only three epididymectomies to thirty-seven castrations. Among the forty-five cases there are nine deaths, and nine could not be followed. Twenty-seven cases have been carefully examined after periods varying from two to nine years. Of these twenty-seven cases there have been twenty-two cures of both local and distant tuberculosis, four with marked improvement of the prostatic, vesical, or general condition, and only one unimproved. In only fourteen of the forty-five cases were the prostate and seminal vesicles found uninvolved; of the other thirty-one the bladder (or kidney) was involved in eleven, the lungs, bones, or glands in five, and in one there was a previous history of bladder disease. Of the thirty-one in which prostate or vesicles were involved, one testicle was involved in seventeen, and both in fourteen cases. After operation the vas deferens was found healthy in but three cases. Of the seventeen cases with the prostate and one testicle diseased, thirteen were followed by complete cures, one improvement, and three deaths. In thirteen cases where both testicles were involved, besides the prostate, nine were cured, two improved, and two died. Of the thirty-three cases operated which did not have tuberculosis outside of the genital tract before operation, of whom twenty-eight were followed, there were twenty-two cures, four marked improvements, one unimproved, and one death four years after operation. The lungs were involved six times, with two cures and four deaths, and the higher urinary tract eight times, with four deaths, two cures, one improved, and one not followed."

Von Bruns[6] reports from the records of the Tübingen clinic one hundred and eleven cases, of which seventy-three were single and

thirty-eight double castrations; the testes were involved in 24 per cent of the cases operated within three months of the beginning of the disease, in 40 per cent within six months, and 60 per cent after six months. Twelve per cent of the unilateral castrates died from urogenital tuberculosis; this includes almost all cases in which the disease had extended to the urinary organs at the time of operation; 15 per cent died from tuberculosis of other organs, and 46 per cent were permanently cured, the latter under observation from three to thirty-four years. Of the bilateral castrates, 15 per cent died of urogenital tuberculosis, 25 per cent died of tuberculosis of other organs, and 56 per cent were permanently cured; observation period three to thirty years. Of all cases, more than one-half were permanently cured; nearly all of these were cases of genital tuberculosis, the deaths including almost all cases in which the urinary organs were involved, and most of these with tuberculosis of other organs.

Simon[7] reports one hundred and seven cases from the records of the Heidelberg clinic, of which the results are known in ninety-two. Of these fifty-nine are alive and thirty-three dead; of the dead, twenty-six died from tuberculosis. In the twenty-six cases there was marked improvement in the pulmonary tuberculosis. Reports were obtained from twenty-nine of the thirty-four double castrations; eight died and twenty-one remained well. In only one case[8] was there marked psychic disturbance; five showed decrease in sexual desire, while in all others there occurred not the least impairment in sexual power or desire, even when the observation had lasted twenty years after castration. At present fifty-four are free from tuberculosis, seven others who had been free from tuberculosis for years died of intercurrent disease, so that 66 per cent were permanently cured.

The advocates of both radical and conservative methods are agreed upon a high resection of the cord: Von Bungner and others accomplish this by slow, steady traction on the vas, being able to remove four-fifths of it in this way before it tears, and Von Bungner claims that neither infection of peritoneum nor serious hemorrhage ever follows.

Lauenstein[9] reports twelve high resections after this method, in three of which he had marked hemorrhage, in one to such an extent that the clot produced temporary blocking of the ureters.

Helferich[10] reports a similar experience. Villeneuve and others accomplish the high resection by means of an inguinal incision, opening the canal and removing the vas under the direction of the eye.

Verneuil and Koenig may be classed as ultra-conservative, since both are averse to castration or epididymectomy with high resection of the vas on account of the so frequent coexistence of other tubercular lesions of the genital tract, contenting themselves with hygienic treatment alone or combined with excision or curettement of tuberculous foci of the epididymis and testicle.

The advocates of the conservative operation—*i.e.*, epididymectomy with high resection of the vas—urge in support of their view the importance of preserving the internal secretion of the testicle, the avoidance of the psychic disturbances occasioned by castration, the preservation of the sexual appetite and power—and this is of the utmost importance, since this condition occurs with greatest frequency during the most active period of sexual life—and finally that this operation is as curative as castration, while lacking in its disagreeable features. Murphy in a recent article advocates this method, and reports a number of cases, followed for several years after operation, which showed complete recovery.

Dimitnesco[11] reports twenty-six cases of epididymectomy, thirteen of which were under observation from one to nine years; of these thirteen, eleven recovered both locally and generally, seven having been unilateral and four bilateral operations. In none of the cases was there dissemination of tuberculosis following operation, and in only one did it make its appearance in the remaining testicle.

Bardenheuer[12] reports thirty-four cases of double epididymectomy in which the results were satisfactory, the testicle remaining normal in size, consistency, and in its function of producing spermatozoa, even though the outlet for same was destroyed. This in itself would indicate the double rôle played by the testicle, since when the excretory duct of a purely excretory gland is obliterated atrophy follows; this, however, does not obtain in the testicle when the epididymis is removed after the method of Bardenheuer—*i.e.*, subserous dissection except of globus major, with the preservation of testicular branches of spermatic artery.

One of the most remarkable results of both castration and epididymectomy is the disappearance of tubercular foci at points other than that operated, not only in the genital tract but even distant lesions; the suggestion has been offered that this was due to the raising of vitality consequent upon removal of foci from which toxins were constantly being absorbed.

Kocher is of the opinion that castration is more apt to be followed by a decline of prostatic tuberculosis than is epididymectomy; various French writers deny this, and, as Young remarks, "as each

has used the method he favors to the exclusion of all others, the statement is robbed of much of its force." Abundant clinical evidence, however, seems to prove conclusively that not only is there a distinct retrogression but oftentimes even cure of prostatic tuberculosis following both operations. This has been noted in many instances where a typical castration without high resection of the vas was made, but the recurrence, or rather the extension of the disease to the remaining testicle, so often noted after this operation, and also seen where the high resection is done, would indicate that too much of the vas cannot be removed. The very rapid subsidence of bladder symptoms following either operation would indicate that these symptoms were not referable to a distinct tuberculosis of the bladder, prostate, or urethra, but to a catarrhal condition of same due to the passage through them of pathological products derived from the testicular tuberculosis.

In conclusion, the following deductions are presented: (1) The epididymis is the most frequent starting-point of urogenital tuberculosis. (2) It is usually secondary to some other focus, but may be a primary deposition. (3) The testicle is rarely primarily affected, but as a rule secondarily so from the epididymis. (4) When the epididymis is primarily infected through the blood-supply the process is probably intertubular. (5) When it is secondary to other foci in the urogenital tract, constituting a descending infection, the process is probably intratubular. (6) Foci in other portions of the genital tract, or even distant lesions, do not necessarily contraindicate operation, since clinical evidence proves that, when operated early, foci in the genital tract recover as a rule, and healing of distant lesions following operation has been noted in a sufficient number of instances to invite further investigation. (7) Castration should be limited to those cases in which the process has invaded the testicle proper. (8) Epididymectomy with high resection of the cord after the method of Villeneuve is to be practiced in all other cases.

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METHODS OF PROLONGING LIFE—A BRIEF HISTORICAL SKETCH.

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Men of science have throughout all ages devoted their attention to the possibility of prolonging life, and have regarded it as a subject worthy of the most profound investigation; and their researches have been attended with great benefit to posterity. As might be expected, the possibility of extending the average length of days has, from the most ancient times, afforded a fascinating and extensive field for the visionary as well as for the deepest thinkers, and plans for increasing the age to which every man can live have usually been among the chief allurements held forth by empirics and impostors. By thus imposing upon the credulity of the public, many notorious charlatans have acquired rich harvests of ill-gotten gains.

Although it would be impossible to review all the schemes advanced, yet an account of the most notable theories advocated for the prolongation of life is certainly deserving of attention. At the same time, an elucidation of their fallacies is of no small moment in order to ascertain their true value. It is most interesting to observe the various and often opposite means advocated by enthusiasts for attaining the same end. As far back as the Egyptian, Greek, and Roman periods, we find the idea of prolonging life prevalent. The Egyptians bestowed considerable attention upon various measures for the attainment of longevity, and they believed that life could be prolonged by the efficacy of sudorifics and emetics if used systematically. Instead of saying, "How do you do?" as the usual salutation, they inquired of each other, "How do you perspire?" In those days it was a general custom to take at least two emetics during each month. Hippocrates and his disciples recommended moderation in diet, friction of the skin, and well-timed exercise, which was certainly a step in the right direction.

It was during the darkness of the middle ages, ripe with fanaticism and superstition, that the most absurd ideas of witchcraft, horoscopes, chiromancy, and empirical panaceas for the prolongation of life first became disseminated. The philosopher's stone and elixir of life were then vaunted by the alchemists. Foremost among the prolongers of life we find Paracelsus (1490–1541), an alchemist of great renown, and a man of some attainments, in spite of his quack methods. He claimed to have discovered the elixir of life, and so great was his influence that even the learned Erasmus did not disdain to consult him. Patients and

pupils flocked around him from every quarter of Europe. Notwithstanding his famous stone of immortality, he died at the age of fifty. His elixir was a derivation of sulphur similar to compound sulphuric ether. Whatever may be said against Paracelsus, it is an undeniable fact that to him we are indebted for our primary knowledge of mercury as a drug. Prior to his time it had not been used as a medicine. About this epoch (1550) Leonard Thurneysser attained world-wide celebrity as an astrologer and nativity-caster. He was a physician, bookseller, and horoscopist all in one. He professed to be able, by the aid of astrology, not only to predict future events, but also to prolong life. He published yearly an astrological calendar, describing the nature of the forthcoming year and its chief events. His calendar, aided by his other work, enabled him to amass a large sum of money. His theory was that every man came within the influence of a certain star, by which his destiny was ruled. Upon ascertaining from what planet a person's misfortunes or sickness proceeded, he advised his patient to remove his residence within the control of a more propitious luminary. In short, to escape from the influence of a malignant to a more friendly satellite was the basis of his method.

Marsilius Ficinus, in his Treatise on the Prolongation of Life, recommended all prudent persons to consult an astrologer every seven years, thereby to avoid any danger which might threaten them. During the year 1470, an individual named Pausa dedicated to the Council of Leipsic a book, in which he most strongly urged all persons desirous of longevity to be on their guard every seven years, because the planet Saturn, a hostile planet, ruled at these times. According to the teachings of astrology, metals were believed to be in intimate connection with the planets. Thus, amulets and talismans originated as reputed agents for increasing the length of a man's life. The disciples of this creed had amulets and talismans cast of the proper metal, and under the influence of certain constellations, in order to protect themselves from the evil influence of adverse planets. These absurd conceits were at a later period revived by Cagliostro, of whom I shall have something further to say. It would appear that the more mysterious and ridiculous the conceptions of fanatics and impostors were, the greater was their success.

The example of the renowned Cornaro (1467–1566) affords a brilliant instance of the superiority of an abstemious life to the foolish doctrines put forth by the astrologers. Up to his fortieth birthday he was excessively intemperate both in eating and drink-

ing, so that his health suffered considerably. He then made up his mind to reform, and to submit himself to a temperate regimen. For the remaining sixty years of his life, which almost reached a hundred years, he continued the observance of his rules, with good result. It is obvious, however, that while life may be prolonged and suffering greatly diminished by exercising moderation in eating and drinking, there are other factors in the problem of longevity, and rules that might be suitable for one person would not apply to another.

Shortly after the death of Louis XIII. of France, who was bled more than forty times during the last ten months of his existence, a contrary method came into fashion. Transfusion was for a time relied upon as a means of invigorating and prolonging life. The operation was performed by aid of a small pipe conveying blood from the artery of one person to another. In Paris Drs. Dennis and Riva were enabled to cure a young man who had previously been treated in vain for "lethargy." Further experiments being less satisfactory, this device as a prolonger of life was discarded. Francis Bacon had somewhat unique ideas concerning the possible lengthening of existence. He regarded life as a flame continually being consumed by the surrounding atmosphere, and he concluded that by retarding vital waste the consumption of vitality might be stopped. He recommended cold bathing followed by friction. In addition, he advocated tranquillity of mind, aided by cooling food and the use of opiates, as he considered these the most suitable measures for lessening internal consumption of "the force of life." He proposed to renovate health periodically, first by a reduced diet combined with cathartics; subsequently through choice of refreshing and succulent foods. With a proper degree of modification there appears to be wisdom in his views, excepting as regards the use of opiates, which are, of course, unnecessary, unless sickness demands them.

Numerous charlatans have appeared—and continue to appear at intervals—who make loud asseverations of having discovered the veritable elixir of life, which usually consists of some nostrum for internal consumption, and with which they mendaciously guarantee to prolong our days. One of the most notorious of these quacks was the Count de St. Germain (died 1784), who with barefaced effrontery protested that he had already existed for centuries by the aid of his "Tea of Long Life," which, he insisted, would rejuvenate mankind. Upon careful examination his miraculous "tea" was found to consist of a simple combination of sandalwood, fennel, and senna leaves. A great stir was created in 1785 by the occult pre-

tensions of a fanatical physician named Mesmer. He boasted of the possession of extraordinary magnetic power, which enabled him forthwith, by its agency, to remove every disease and prolong life. At the instigation of the French government a scientific commission was appointed to report upon the various phenomena, and the practical result was the discovery of what was then called "animal magnetism," afterwards "mesmerism," and now "hypnotism." Mesmer had unquestionably ascertained that the hypnotic condition could be produced in certain cases, either with or without the aid of a "medium;" but the rest of his assertions had no grain of truth in them. Prior to the report of the commission, he had refused three hundred and forty thousand livres (about $68,000) for his discovery, which became unsalable as soon as the truth was made known. Mesmer lapsed into obscurity soon afterwards. Last, but not least, in the rank of impostors was Joseph Balsamo, alias Count de Cagliostro (1743–1795). During this man's very remarkable career he made more than one fortune, which he subsequently lost, and he died in prison in 1795. The well known Cardinal de Rohan was one of his chief dupes. Like Saint Germain, Balsamo boasted that he had discovered the elixir of life, and throughout Europe there existed large numbers of persons who were eager to possess his panacea. This elixir was a very powerful stomachic, possessed of great stimulating properties. As is quite well known, it is a fixed law of nature that every drug which tends to increase the vital forces also tends to abridge their duration. Concentrated and potent stimulants, which are generally the active principle of most "elixirs of life," while for the time increasing strength in some way, are prone to lose their effect if their use is continued for any considerable period, and, in any event, they are prejudicial to longevity. Before proceeding to mention the methods which, as far as our present knowledge goes, appear to be the most certain for promoting longevity, I propose to examine certain theories which, although of very little practical value, are worthy of some attention, because they show the direction which men's minds have taken in the past.

The plan of "hardening"—based upon a false supposition that by toughening the physical organs they would wear longer—obtained at one time numerous followers. When we remember that the main principle of life depends upon the pliability of every organ, combined with free circulation, it naturally follows that rigidity must be unfriendly to long life. Continual cold baths, exposure to keen air, and exhausting exercise, were advocated by the "hardening school."

Like most enthusiasts, the disciples of this school carried their ideas to excess, and forgot that moderation in everything is the best policy. Later on, a theory well suited to the idle and luxurious gained many adherents—namely, to retard bodily waste by a trance-like sleep. One fanatic, Maupertuis, went so far as to propound the possibility of completely suspending vital activity. Even some well educated physicians, having observed the restoration of apparently dead insects by exposure to warmth, were struck by the feasibility of promoting long life by the agency of immobility. The error of this hypothesis, from a physiological point of view, is self-evident, as want of exercise is absolutely poisonous to health. Physical well-being must depend, to a great extent, upon a constant metamorphosis of the tissues, and a destructive plethora would certainly be induced by attempting "vital suspension."

That celebrated sect of mystical philosophers, the Rosicrucians—famous for their profound acquaintance with natural phenomena, and with the higher branches of physical, chemical, and medical science—considered that human existence might be prolonged far beyond its supposed limits. They professed to retard old age by certain medicaments, whose action upon the system would curb the progress of natural decay. The means by which they undertook to check senile decrepitude were, like other mysteries of their fraternity, never revealed. The celebrated English Rosicrucian, Dr. Fludd, whose writings, such as "Fama Fraternitatis" and "Declaratio Brevis," became famous, is said to have lived a century. The Rosicrucians became extinct about the year 1700. The history of the society is very obscure.

The chief disadvantage of the various ancient plans which have been set forth for the promotion of longevity is that they are all deficient in one important respect, viz., they regard one special object, to the neglect of other conditions. However beneficial any theory may prove, it must be materially inadequate for fulfilling its purpose if numerous other matters of the greatest importance bearing upon the human economy be ignored. The real art of longevity consists in cultivating those agents which protract existence, and by avoiding all circumstances tending to shorten its duration. This is undoubtedly the most reasonable method for obtaining the end in view. Moderation in all things, shunning, as far as practicable, every morbific condition, and open-air exercise are much more reliable methods of prolonging life than are any of the elixirs ever manufactured. Health and longevity can only be attained by an intimate acquaintance with and obedience to

those natural laws which govern our physical economy. Upon this topic much valuable information may be obtained by reading the latest edition (1902) of "Diet in Relation to Age and Activity," by Sir Henry Thompson, an English surgeon of great experience, now well past his eighty-first birthday.

In 1889, Dr. Brown-Séquard, an eminent physician who was professor of physiology at Harvard from 1864 to 1869, announced that he had discovered, not an elixir vitæ, but a rejuvenator. He described its composition in the following words: "To the blood of the testicular veins, semen and juice extracted from a testicle, crushed immediately after it has been taken from a dog or guinea-pig, I add distilled water in a quantity which never exceeds three or four times their volume. The crushing is always done after the addition of water. The liquid is then filtered through filter-paper or a Pasteur filter. For each injection I use sixteen minims of the filtered liquid." Dr. Brown-Séquard first experimented upon dogs, then upon himself, and according to his view the results were satisfactory. The liquid was injected hypodermically, and it consisted very largely of spermatozoa—and billions of microörganisms. It was not sterilized, for the process of sterilization would probably have deprived it of whatever value it was supposed by its discoverer to possess. In the case of aged dogs, the injection of the seminal fluid of other dogs appears to restore temporarily a certain amount of sexual desire, but that is the extent of the rejuvenescence. In the hands of others, Dr. Brown-Séquard's fluid proved a complete failure, and was quickly forgotten, as might have been anticipated, as old age is a normal and purely physiological process. Its author died in 1894.

Turning to what is scientific, the late Sir George Humphrey, an English physician of repute, devoted a greal deal of time to an elaborate investigation of facts concerning longevity. He examined the family history of about one thousand persons, seventy-four of whom were nearly one hundred years old. His conclusions were somewhat as follows: The most important factor is a "good" constitution, which appears to be largely dependent upon satisfactory digestive and nutritive functions. An energetic temperament and active habits are conducive to long life, but it is impossible altogether to avoid the conclusion that the vital machinery is wound up, so to speak, for a given period, and except for accidents—or in spite of them — it is likely to go on till the appointed time has elapsed. These assertions, if correct, are not explainable, and they obviously involve some extremely complex problems of heredity of which science has hardly touched the fringe.

To an individual who comes of a short-lived family, extreme old age is seldom vouchsafed. Upon the other hand, to the Jews, who are remarkable for their longevity, unsanitary surroundings and uncleanly habits—it is undeniable that immigrant Hebrews are often uncleanly—seem powerless to increase the mortality to any appreciable extent.

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BOOK REVIEWS.

ATLAS AND EPITOME OF ABDOMINAL HERNIAS. By Privat-docent Dr. Georg Sultan. Edited, with Additions, by William B. Coley, M.D. Price, $3.00. Philadelphia and London: W. B. Saunders & Co. 1902.

This volume contains 119 illustrations, 36 of them colored. It appears uniform with the other volumes of the Hand Atlases. In speaking of the illustrations, Coley says that in this volume they excel those of any other work upon hernia. The well-known work of Macready will always remain a classic, but it does not deal with the operative side of the subject. It is this latter feature of hernia that has been of growing importance in the last ten years. The first part of the work deals with hernia in general. In reference to the frequency of hernia, the statistics of Berger are quoted. These show that in the first year of life, in each one thousand individuals, there are 19.6 cases of hernia. The lowest semi-decennial percentage in the development of hernia is found in the twentieth to the twenty-fifth year, when the percentage among one thousand persons falls to 0.38. At the sixtieth year there is a rapid increase until the eightieth, when there is an abrupt fall in the number.

The sites of hernia are beautifully figured, together with the distribution of fascia and muscular tissue which guard the usual openings. The sac of a hernia is defined as that portion of the peritoneum which protrudes through a hernial orifice. A case in which the abdominal viscera protrudes through the abdominal wall without a cutaneous covering is spoken of as a prolapse. In certain cases of congenital fissure of the abdomen the intestines may pass into the pleural cavity without a peritoneal covering. Custom designates these cases as hernia, though incorrectly. The same is true when scar tissue in the abdominal wall gives way. Subperitoneal lipomata, which are so confusing from the standpoint of diagnosis, are adequately figured.

In speaking of the development of hernia, Koch's theory is rejected. In congenital hernias there is a developmental defect, and such protrusions may be complete at birth, or an increase in intra-abdominal pressure may cause a protrusion in a congenital sac. It is stated that acquired hernias never arise from a single increase in intra-abdominal pressure, be it ever so violent. More than half of the work is taken up with the description of the general treatment of hernia, mostly operative. There is a brief review of the early efforts to cure hernia by operation. The table given of the liability to recurrence after operative procedures shows a progressive improvement in results since 1895. Coley, in 500 inguinal and 31 femoral hernias, had only 7 relapses.

TREATISE ON DISEASES OF THE SKIN. By Henry W. Stelwagon, M.D., Ph.D. Price, $6.00. Philadelphia and London: W. B. Saunders & Co. 1902.

This work of 1115 pages is a very striking addition to the literature of dermatology. It contains 220 illustrations in the text, and 26 full-page lithographic and half-tone plates. These are largely from the writer's collection of original photographs. A number of the colored plates are from Mracek's Atlas.

The work opens with a description of the anatomy and physiology of the

skin. The chapter on physiology of the skin is especially full. The often-quoted case of fatal result following the gilding of a boy at the installation of Leo X. is looked upon as somewhat doubtful, notwithstanding the number of experiments made upon animals in varnishing or covering the cutaneous surface with an impregnable substance has not had its full physiological effects studied. There is a doubt as to the procedure causing death in the boy's case, as the fatal results following experiments in the larger animals show that they come on slowly. The valuable studies of Holscher and Wesener on the composition of sweat are not referred to, and the old formulas on the composition of this substance are retained. Unna's contention that the sweat glands are the main factor in the production of seborrhea receives feeble support.

The chapter on general etiology shows a wide grasp of the underlying pathologic factors in the development of diseases of the skin. In speaking of personal hygiene, the writer says: "There is a prevalent belief that skin diseases as a whole are found among those who live in filth and uncleanliness, and no one can gainsay that such have some effect as contributing factors in some of the cutaneous eruptions among the poor and uncared-for. These factors naturally tend to make the distinctly parasitic affections more numerous with such classes. They are, however, more than set off by the habits, customs, and overfeeding of the luxurious, and by the active life and tension of the middle and upper strata of society. Extreme cleanliness—a too free or injudicious use of soap and water, Turkish baths, etc.—is sometimes responsible for the production or aggravation of certain integumental diseases. On the other hand, scant use of such measures, not necessarily to the point of absolute uncleanliness, is sometimes an element in seborrhea, acne, keratosis pilaris, and a few others."

In the matter of classification the writer refers to the prevailing confusion. He adopts Hebra's classification, with the modifications of Crocker, as the most practical.

In the description of diseases the writer shows a thorough grasp of clinical medicine. The descriptions of treatment are especially full, and commend the work to those who have but a limited knowledge of diseases of the skin. Many of the illustrations in the text are reproductions of photographs, and these are of little value excepting as they show the distribution of eruptions. Without the aid of color very inadequate representations of a skin affection are secured.

PRACTICAL MEDICINE SERIES. Edited by Gustavus P. Head, M.D. Volume VII, Dealing with Materia Medica and Therapeutics; Preventive Medicine; Climatology; and Forensic Medicine. By George F. Butler, Henry B. Favill, Norman Bridge, and Harold N. Moyer. The Year-book Publishers, June, 1902.

Butler makes the following criticisms on contributions to therapeutics during the past year and a half: "It is noticeable that less progress has been made than in any other branch of medicine. Numberless new remedies have been manufactured, but the majority of these are combinations of old and simple substances for which credit must be given to the manufacturing chemist or pharmacist. But real advances in knowledge of physiologic action of drugs have been few." Organotherapy has received its share of attention. Therapeutic measures other than drug medication are relied upon to a greater extent

than formerly. The most remarkable advances have been made in the application of the Roentgen ray in the treatment of malignant growths.

In the field of preventive medicine, Favill says that the usual contributions are much more voluminous in respect to disease prevention than to health preservation. Exhaustive consideration is given transmissibility, while there is meager allusion to susceptibility and its correction. The superiority of systematic physical training over the exaggerated development of "sport" for the young is discussed, but there is no note of warning to the elders as to their greater necessities. Food adulterations and general quality have abundant notice, but individual temperance, the key-note of health, is quite ignored. The field of contention must be, until settled, whether bovine tuberculosis is transmissible to man. No course is open but conservation of the progress already made upon the hypothesis of possible transmissibility.

In condensing the scientific papers of the year on climatology, Bridge is impressed with the difficulty in getting at the exact value of different climates for the sick. The articles in this department are mostly contributed by men who reside in the locality about which they write. They are made up of three elements: (1) Scientific facts bearing on the climate, such as temperature, humidity, cloudiness, latitude, etc.; (2) personal experience and observation of the effect of the climate on health; and (3) arguments in favor of the particular climate and against the influence and qualities that rival climates possess. There seems to be a tendency to indulge too freely in the third, and even to consider the second with a good deal of bias.

Moyer, in discussing forensic medicine, says that the discovery of the serum test in the identification of human blood is the most important contribution in this department.

THE NEUROSES OF THE GENITO-URINARY SYSTEM IN THE MALE. By Dr. R. Ultzmann. Second Edition, Revised, with Notes and a Supplemental Article on Nervous Impotence by the Translator, Gardner W. Allen, M.D. Price, $1.00. Philadelphia: The F. A. Davis Co. 1902.

This is a reprint of a translation of Ultzmann's two monographs, "Ueber die Neuropathien des mannlichen Harn und Geschlecht-sapparates," and "Ueber Potentia generandi und Potentia coeundi." The number of works upon this topic which have appeared in recent years have added comparatively little to our knowledge, as will be seen by a reference to the two monographs of Ultzmann. The principal additions relate to a more perfect understanding of the diseases of the prostate, seminal vesicles, and involvement of the deep urethra, and their relations to functional disturbances of these parts.

LEADING ARTICLES.

LEUCOCYTIC CHANGES FOLLOWING INTRAVENOUS INJECTIONS OF CINNAMATE OF SODIUM.

Cinnamylic acid was employed in the treatment of tuberculosis by Landerer as early as 1888. He believed that the essential process in the healing of a tuberculous focus was the development of new vessels, and that this was stimulated by a general leucocytosis. As a result there was newly formed connective tissue thrown out and a cicatrix was formed. In all respects he thought that the reaction in the blood produced by cinnamylic acid was similar to the natural process, but it was quicker and the results were more enduring. Instead of the acid, Landerer later used the cinnamate of sodium under the name "hetol."

O. Amerin (*Lancet*, July 12, 1902) reports upon thirteen cases in which the hetol treatment was used after the prescribed method, namely, intravenous injections. A table is given in which the number of days the patients were under treatment is stated, the number of injections, the maximum dose, which in no case exceeded twenty-five milligrammes, the results of the injections, and the effect upon the general condition of the patient. He always began with one milligramme, the injections being given every third day and increased by one milligramme until ten milligrammes had been reached, and then by two and a half milligrammes until the maximum dose of twenty-five milligrammes was reached. The injections are made by throwing an elastic ligature about the arm and then injecting the salt directly into the vein. The temperature was taken at intervals of two hours after the injections, and only in cases where it did not exceed 37.3° C. was the dose increased beyond ten milligrammes. The general results in these thirteen cases were good in three in whom the disease was in the early stage. In those who were in the second and third periods the results were either negative, or at the most uncertain. In the cases that were improved it was impossible to say whether the results achieved might not have been reached by the climatologic and dietetic treatment alone. The results were not more favorable in some of the cases than those achieved in cases where no injections were given. The patients were all treated at Davos and Arosa, both of which places have a favorable climate for tuberculosis. In two young women whose condition seemed to be stationary, and who

had been at Davos for one and a half years, a course of one month did not seem to have the disease materially improved by the injections.

L. Drage (*Lancet*, July 12, 1902) discusses the value of the cinnamate of sodium in the treatment of tuberculosis, or cancerous processes. He reports only four cases, but these present acute ulcerative processes in the lungs, or other organs, in which there was marked improvement in the symptoms upon the injection of cinnamate of sodium.

H. B. Shaw (*Journal of Pathology and Bacteriology*, March, 1902) has made extensive experiments with cinnamate of sodium. He comes to the conclusion that there is a general leucocytosis caused by this drug. The effect is not produced by depriving the blood of a certain amount of liquid, thereby tending to leave in the vessels relatively more corpuscles per cubic millimeter. The injections of the cinnamate of sodium stimulate the simpler leucocytosis to a transformation into polymorphonuclear cells and intermediate forms. The administration of ether has a similar effect, though it is not so complete in character. The spleen seems to take no part in this process. The cinnamate of sodium causes a diminution in the percentage of eosinophile cells.

G. T. Morgan (*Lancet*, July 12, 1902), in an addendum to Drage's paper, points out some of the difficulties in the use of cinnamate of sodium, because it is not soluble in the usual menstrua. He has found that a practicable solution for use in the hypodermic syringe may be prepared by dissolving the salt in glycerin. This solution is more reliable than the emulsions, which alter in composition by subsidence, while the glycerin solution remains unchanged for an indefinite time. The glycerin solution is prepared by heating the dry powdered sodium cinnamate with the pure solvent to a temperature of 180° C. This readily gives a solution of from 10 to 11 per cent. It is important that solution should be effected promptly, as prolonged heating results in the formation of acrolein.

These communications relative to the value of cinnamate of sodium show conclusively that it does cause a leucocytosis. This property it has in common with many other substances, and the exact value of this from a therapeutic standpoint is still to be determined. The reported cases vary so much that no accurate judgment can be formed. In some of the cases, like those of Drage, there was a marked improvement in an apparently hopeless condition in which patients were greatly enfeebled; this has been noted where nuclein has been used, which is also credited with producing or

stimulating a normal leucocytosis. The favorable results with cinnamate of sodium have been obtained in those cases in which the process was in the early stage, and were most of them combined with satisfactory alimentation, or a climatic cure. These cases must be eliminated in estimating the value of the cinnamate of sodium, as they would probably have improved if the drug had not been administered. The cases in the second or even the third stage in which there was a secondary mixed infection show the most marked reaction to the cinnamate of sodium, and to other drugs which stimulate leucocytosis. The value of an induced leucocytosis has been shown in so many cases that it cannot be doubted. Its value in tuberculosis is less than in other infections, but the whole subject is, from a therapeutic standpoint, in such a vague and unsatisfactory state that much work will have to be done upon this line before a definite conclusion can be reached. One thing is certain: the results so far achieved, and the probability that this normal process of leucocytosis does have something to do with repair, give it great interest, and make it worthy of further study.

EDITORIAL COMMENT.

IS MEDICAL PRACTICE TENDING TOWARD SPECIALISM?

Medical specialism is frequently discussed in medical meetings, and the prophecy has been repeated that soon the general practitioner will become a thing of the past, except where the absolute rarity of population prevents the gathering of specialists and compels the physician to adhere to old ideals and customs. In most cases the argument is more or less distinctly the mathematic one of rate of progress. Fifty years ago there were practically no specialists; now there are so many to the hundred—figures differ so widely that we make no pretense at quoting them—and in fifty years more most of the profession will be specialists. The fallacy of such argument ought to be apparent. No one cautions against thyroid extract on the ground that if four pounds of fat is lost in a week the patient will be a living skeleton in six months or less. Few physicians are converted to Malthusianism by the fact that at the present rate of increase of population the whole world will be filled to the limit of its food-raising capability in something like two centuries. In short, for everything else, we recognize the inherent fallacy of the argument of proportionate increase and recognize that undue progress in any direction always tends to self-correction.

We find to-day, as fifty years ago, but one specialty organized as distinct from the general medical body—dentistry. There are excellent practical reasons why this should be the case, and, as never before, we find a spirit of reciprocity and a community of professional ideals uniting the dental and the medical professions. We note a growing conviction that the eye, ear, and skin can be better treated by specialists, who attempt only the most general attention to the general health of the patient. Correspondingly, we recognize that major surgery, and especially that of the peritoneum, cannot be safely entrusted to the occasional operator. The care of the insane is being more and more limited to a branch of the profession who are specially trained and organized, yet we must look at medicine from the broadest possible standpoint. With these exceptions the development of specialism has rather been checked within the last ten or fifteen years. It is a most wholesome indication that the specialist is no longer born after a brief gestation at a post-graduate school. General practitioners and specialists of repute

have united to enforce the dictum that the true specialist must be formed by the slow process of evolution from a general experience, which must be considerable both in clinical observation and in time. In other words, that part of the medical profession which is relatively most numerous because there has not been time for attrition is practically compelled to remain in general practice.

Another most significant and most favorable condition of specialism is that the general practitioner has come to recognize the ridiculousness of specialism as a side issue to a general practice. Both as a matter of business fairness and of professional attainment, it has been demonstrated that the specialist must abandon his general practice as soon as practicable.

The recognition of the last principle places the specialist where he belongs, at the mercy of the general profession. A very poor general practitioner may make a good living simply because one case leads to another, through accidental acquaintance. But the law of chance renders it practically impossible that the specialist shall meet in this way a sufficient number of patients of his own category. Many, perhaps the majority, of his patients go to him without being specifically sent by their physicians; but his reputation rests entirely with the medical profession, and the natural tendency is toward the survival of the fittest.

The specialist is judged more severely, as is right, than the general practitioner, and he is judged both by his practical results in the treatment of patients and by his technical and scientific knowledge, which he must keep constantly before the general profession. If he fails to maintain the standing required, both by patients and by the medical profession, he becomes a factor of too slight importance to be considered seriously.

The matter of convenience is an important factor in the prevention of too high a degree of specialism. Just as the department store now controls the one-line dealer who, fifty years ago, threatened to exterminate the general storekeeper, just as society is already protesting against the ridiculously fine lines of organized skilled labor, so the physician who is prepared to attend any case, at least at the outset, must necessarily receive the great majority of medical work. Indeed, the danger is not so much that the specialist will drive the general practitioner out of the field as that the latter will, on account of the terrible struggle for a livelihood which the overcrowding of the medical profession produces, refuse to relegate the more difficult cases to the care of the specialist.

It should be considered, not only whether the specialist is

removing from the general practitioner the opportunity to attend cases, but whether the former is winning more than his fair share of pay. Unquestionably, the average income from special practice is greater than from general practice. On the other hand, the largest professional incomes are those of the general practitioner. But in comparing incomes it is obviously unfair to assume that the specialist's income should not exceed that of the average of the entire profession. The specialist begins, let us say, with five years' experience in general practice, so that the comparison should be made after excluding all physicians of less than this length of experience. More than this, the specialist cannot exist as such without demonstrating a degree of practical skill and of theoretic knowledge that is considerable. If we contrast him with men of the same degree of prominence in general medicine, there is no doubt that the specialist, far from threatening the financial welfare of the general profession, receives less for his efforts than the general practitioner of the same grade.

MALPRACTICE SUITS BY CHARITY PATIENTS.

An examination of the records of Cook county, Illinois, shows that a large proportion of the malpractice suits brought against physicians have been by charity patients, who were operated on or treated in a general hospital as charity cases, the attending physician or the hospital receiving no compensation for the care and attendance. There have been numerous court decisions of late dealing with the relations of charity patients to the institutions of which they were inmates. Some of these decisions have held that patients who paid for their maintenance in whole or in part were subject to a somewhat different rule than those who were received purely as charity patients. In actions against the institutions it was held that the payment on the part of the patient established a contractual relation with the institution. Such view of the case has been rejected by some courts with the statement that it is intolerable that a degree of protection should be extended to a paying patient which would not be accorded to one who did not pay. A broader and more correct view in defining the relation has been taken by most courts, these holding that a charity is not liable to a patient whether he paid or not, as it is in effect a diversion of a trust fund from the purpose for which it was designed. Such decisions have held that the trustees of a charity are responsible for the selection of reliable agents in the

administration of the charity, and only in so far are they liable to the patients.

In every case in which a suit has been brought by an inmate of a hospital against a member of the staff, it has been defended upon the ground that he was not guilty of malpractice, having possessed and exercised that degree of care which the law requires in the discharge of his duties to the particular case. So far as we are aware, there has been no effort on the part of the defendants in these cases to shift the degree of responsibility because of their relation to a public charity or a charity patient. It is not for us to suggest what rule of law should be adopted to protect physicians from the unwarranted actions of malpractice brought against them by charity patients, but the inequitable nature of most of these suits is apparent. They are brought by not the most reputable members of the legal profession, frequently upon the most flimsy evidence, and subject the physician to great expense. Surely there should be some way of distinguishing between a charity patient in a public institution in which a physician is a mere official and a patient who seeks him voluntarily and compensates him for his services. The cases differ so radically in their fundamental relations that it is inequitable to give them the same rights in an action for malpractice.

THE EARLY TREATMENT OF MENTAL CASES IN GENERAL HOSPITALS.

The importance of prompt treatment in mental cases has long been emphasized by alienists, but it is far from being carried out with anything like the precision that it should be. This arises from the fact that special hospitals have been erected for the treatment of the insane. Admission to these has always been governed by some sort of certification with the approval of the Courts of Record; hence there was more or less delay in bringing the patient under asylum treatment. In a commonwealth in which the admission of lunatics has the medieval stamp of trial by jury, as in the State of Illinois, it is but natural that individuals should shrink from taking the last step necessary to bring a patient under hospital care, as it involves the legal disability of a lunatic.

There is no reason why every large general hospital should not have a department for mental cases. There are a sufficient number of cases of pneumonia, typhoid, chronic kidney and heart cases in which mental disturbance is a prominent complication to furnish a demand for such a division. These patients are with difficulty

treated in the general wards. Such a psychiatric department could easily be made to include the treatment of the acute insane and those cases that could be kept under observation pending their admission to a special hospital. Such detention would be free from the stigma which attends an ordinary commitment to an asylum, and would be a measure to which the patient or his friends would readily consent; hence prompt treatment of mental disease which is so important could be secured. In mild cases of insanity the friends of patients shrink from certification until the conduct of the patient has become so outrageous, or the fear of suicide is so pronounced, that they are actually driven to take the necessary steps. This would all be overcome by a proper department for mental diseases in a general hospital. There is nothing in mental diseases to separate them from other bodily ailments. They are frequently dependent upon diseases of other organs and nutritional disturbances, and are as much entitled to the attention of hospital authorities as are the ordinary internal maladies, or disorders requiring surgical treatment. Even in smaller hospitals provision could be made for the reception of a few mental cases.

In this way, and, we believe, in this way alone, can the present disastrous dislocation between the onset of mental disease and its early treatment in a properly equipped institution be bridged.

SPOONFUL DOSES.

It is conceded that well made liquid preparations are the best form in which to give many drugs. The effects of quinine are enhanced by having it in solution. The administration of the drug in capsules or pills means a delay in entering the circulation even where the container is broken up. If the latter fails of disintegration the drug passes on into the intestines and out of the body without exerting its therapeutic activity. Where proper physiological effects of a drug are desired, and somewhere near the physiologic limit of doses, it is almost essential that it should be given in the liquid form. Indeed, this should be the rule in the administration of most drugs.

The common liquid measure resorted to in the administration of medicines is the teaspoon, the dessertspoon, and the tablespoon. These are held to be equivalent to one, two, or four drachms respectively, or to four, eight, and sixteen cubic centimeters. The objection to the latter figures is that they are not in con-

formity with the usual decimal equivalents, and it is difficult in constructing a prescription upon the decimal system to regulate the dose in accordance with square numbers. The decimals 5, 10, and 15 have been used, but they are arbitrary and do not correspond with the average quantities contained in the domestic utensils of which they are supposed to be the equivalents. The wide variation in the size of teaspoons is shown by the directions of the German pharmacists where prescriptions are always compounded by weight to estimate a teaspoonful at from three to five grammes, a dessertspoonful from six to eight grammes, and a tablespoonful from ten to fifteen grammes, in figuring poisonous doses. The dosage of powerful remedies should be more accurate. It is a practical thing, and would add very little to the expense of prescriptions, to add a small glass over the neck of the bottle, upon which should be accurately marked the quantities of a teaspoon, dessertspoon, and tablespoon.

A MOSQUITO CAMPAIGN IN NEW JERSEY.

The importance of mosquitoes as conveyers of disease has found its first expression in the statutes of New Jersey. There is something peculiarly appropriate in having the matter taken up by the lawmakers of New Jersey, as this State has an unenviable notoriety because of the number of its mosquitoes. It has been a matter of common belief that in this section these pests acquire a size and a voracity that is not equaled in other parts. Either in self-defense, or in a desire to actually learn something about mosquitoes, the senate and general assembly of the State of New Jersey have enacted the following law:

"1. That the New Jersey Agricultural Experiment Station be and the same is hereby empowered and directed to investigate and report upon the mosquitoes occurring within the State, their habits, life history, breeding places, relations to malaria and other diseases, the injury caused by them to the agricultural, sanitary, and other interests of the State, their natural enemies, and the best methods of lessening, controlling, or otherwise diminishing the numbers, injury, or detrimental effect upon the agricultural, sanitary, and other interests of the State.

"2. The sum of $10,000 is hereby appropriated to the New Jersey Agricultural Experiment Station to be applied to and expended for the purpose mentioned in Section 1 of this act."

The above law passed the house with little opposition, but in the senate there was some unfavorable comment, and for the time

being it was pigeonholed, but was later resurrected. In the effort to pass the bill it was nearly lost by a tie vote, but one of the votes was changed to a negative, and then on motion to reconsider the measure was finally passed, for it was learned that there was a strong sentiment in the State in favor of its passage. Unfortunately, the money which should have been appropriated with the bill is unavailable, but it is thought that the governor will set aside the sum named from the emergency fund, so that the work may be started during the current year.

A part of the fund will be devoted to the study of the transmission of malaria in certain districts of the State in which the Anopheles is abundant. An effort will be made to study the conditions under which mosquitoes breed in sections of the State in which malaria is prevalent, and a comparison of these two studies will be made in the hope that it will throw some light upon the habits of Anopheles.

SURGICAL EXPLORATION OF THE UPPER ZONE OF THE ABDOMEN.

The difficulty of diagnosis in involvement of the upper zone of the abdomen is well understood by clinicians. The frequency with which cancer of the stomach pursues a latent course, the rare cases in which there is involvement of the pancreas, and the still more frequent disorders of the hepatic ducts, in which neither the objective examination nor the subjective statements of the patient, nor, indeed, any investigation that can be made, will clear up the diagnosis, are sufficient to justify the exploration in this region. We cannot emphasize too strongly the value of surgical exploration, particularly as it is almost devoid of mortality. The old feeling that opening the peritoneum is a dangerous procedure lingers in the mind of the profession. We are slow to learn that a mere incision in healthy peritoneum, where infection is avoided, is practically innocuous. The large mortality attending certain abdominal operations is due to the conditions for which they are undertaken, and not the operation *per se*. When this lesson of the slight risk that is taken in an exploratory operation where the peritoneum is not inflamed, and in which there is no infection, is learned, then many more lives will be saved by an early and accurate diagnosis, and the institution of surgical procedures where such can be carried out. An exploratory incision need not be more than two or three inches in length, and if this is made with care in the upper portion of the abdomen, there

is no danger of hernia. If conditions are discovered within the abdomen that are inoperable and which will not yield to medical treatment, then the incision can be closed and the patient is no worse for the exploration. We feel safe in enunciating the rule that, given a patient with disturbance of digestion, persistent vomiting, or pain in upper portion of the abdomen, whose symptoms do not yield to well directed medical treatment, and whose condition is gradually becoming worse, such patient should have the benefit of an exploratory laparotomy. This operation should be undertaken before the strength of the patient is so far exhausted that a radical procedure could not be instituted in case conditions were found which could be remedied.

AN IMPROVED METHOD OF PERCUSSION.

The limitations of percussion in thoracic and abdominal disease are quite well understood. In the majority of instances percussion is carried out by tapping with the fingers of the right hand upon the backs of the fingers of the left hand laid flat upon the part. There are certain limitations to percussion when performed in this manner that do not obtain when some substance other than the fingers is brought between the wall of the cavity to be percussed. The fingers may not fit the part accurately. They inevitably cover a considerable surface, and consequently the vibrations are conducted over a considerable area. Various substitutes for the finger, made of rubber and celluloid, have been devised, which have for their general purpose the limitation of the area which is to be percussed. The disadvantage of these, as compared with the finger, is that the sense of resistance which is of such value in diagnosis is left out.

A method devised by J. Plesch, of Budapest, combines both methods to advantage. He uses the middle finger of the left hand, but instead of laying it flat upon the chest, only the tips of the fingers are brought in contact with the part to be percussed. The finger is bent at a right angle at the second joint and the percussion is made over the first phalanx. In this way the vibrations are limited to a small area, and are accurately brought out; at the same time the vibrations are conducted to a considerable depth into the tissues, because of the limitation of the surface application. More precise data are furnished by this method of percussion than by the usual means. The value of the method has been proven by Plesch, who has confirmed the results by radioscopic examination.

THE PATHOLOGY OF MIGRAINE.

A recent monograph (Ueber Migräne, von Dr. Alexander Spitzer, Jena, 1901) discusses in a logical manner the old and newer theories of migraine, and analyzes the literature up to date. This study is not only etiological, but clinical and anatomical. The pathological substratum of the migraine constitution Spitzer regards as an absolute or relative stenosis of the foramen of Monroe. The walls are thickened and the opening is rigid. The development of the migrainous attacks is in part mechanical. There is a swelling of the choroid plexus, and associated with it is a general cerebral hyperemia. The swollen plexus occludes the narrowed foramen; there is an increase in the intraventricular pressure which causes a headache, dizziness, and other symptoms that make up the attack. The varying symptoms of migraine in different individuals are discussed at length, and it is surprising how naturally they come under Spitzer's explanation. The facts advanced by him in support of his theory are practically *nil*, but it is a brilliant example of the scientific use of the imagination.

Some years ago a theory was advanced that it was the occlusion of this foramen that led to the development of hydrocephalus. An effort at surgical relief in some of these cases was made, but with indifferent success. The dilatation of the foramen of Monroe is a difficult operation from a surgical standpoint, though we would not be surprised if an effort were made to relieve some cases of migraine by operative procedures, based on Spitzer's theory.

CONCENTRATED FOODS.

There is a prevalent idea in the profession that foods can be concentrated. This thought finds its reflection in the advertising pages of medical journals in the highly colored claims of manufacturers of prepared foods. The three main constituents, proteid, carbohydrate, and fat, are represented by such typical examples as meat, sugar, and fat. Meats may have their water driven off and be reduced to powder form; in this way their bulk is diminished to about one-fifth their former quantity, but in order to be taken and absorbed they must have the water restored to them. Sugar is practically water-free, and represents the most concentrated form of carbohydrate available. Fats in the form of butter contain nearly 90 per cent of carbohydrate. A greater concentration of fat than is contained in these natural products is not possible, and for the most part the

manufactured food products contain far less units of energy than do the natural products. About the only purpose for which concentrated foods are useful is in furnishing the nutriment in a more palatable form, or else, if it has been acted upon by certain digestive ferments, in such a way as to facilitate its absorption. As a matter of fact, it is rare that predigested foods are required. If a stomach is capable of passing the food on into the intestines, there is such an excess of digestive capacity in most individuals that it will be dealt with in such a way as to permit of its absorption.

THE ACTION OF X-RAYS ON GRANULATION TISSUE.

The effect of the *x*-rays in cancer has been so remarkable that it has led to the use of this method of treatment in a great variety of conditions. W. A. Pusey says the *x*-rays have a power of dissolving newly-formed connective tissue structures as well as epithelial growths. He reports a number of cases in which contracted, thick scars have become soft, pliable, and thin under the application of the *x*-rays. A case of keloid cleared up quite rapidly under the application of the *x*-rays. The success of it in these cases has led to an effort to treat the hypertrophied prostate. So far the details of the method have not been perfected, hence nothing can be predicted as to the success of the method. If newly-formed connective tissue can be caused to disappear in a scar upon the skin, why cannot the same structures be dissolved in the prostate? If here, then why not in the treatment of ordinary sclerosis? We have not yet heard of the *x*-rays being employed in the treatment of cirrhosis of the liver, but expect to read of it within the next few weeks.

ABSTRACTS.

MEDICINE.

A Vegetarian vs. an Animal Diet.—CAMPBELL, H. *Lancet*, vol. clxii, No. 26 of vol. i, p. 1850, June 28, 1902.

The writer has contributed four articles to the current issues of the *Lancet*, under the general title "Observations on Diet." In the fourth paper he discusses the difference between an animal and a vegetable diet. The popular opinion that meat is the only animal food is erroneous. An excess of fish or fowl may be quite as injurious as an excess of meat. Among animal foods should be placed milk and eggs and their derivatives. On the other hand, vegetable foods should include only those products consumed by a strict vegetarian, and not this diet fortified by a vegetable proteid artificially isolated. Discussed in this way, the question of vegetarianism is very much narrowed.

A vegetable diet is relatively bulky and contains ingredients which stimulate intestinal peristalsis and augment the feces. Vegetable food is more likely to ferment, but is incapable of undergoing putrefaction. Animal food, while putting more mechanical work upon the stomach, is more stimulating to the gastric glands owing to its richness in proteids. Proteids are, generally speaking, more stimulating, though increasing the flow of urine and making it more acid. A practical deduction is that in irritable states of the nervous system much good may be done by deanimalizing the diet. Experience as well as analogy confirms the view that man is naturally a mixed feeder, even though some races subsist solely upon animal and others upon purely vegetable food, but taking the whole world over, it is found that man subsists best upon a mixed diet. Upon a meat diet, the quantity of proteid that must be absorbed in order to obtain the requisite carbon is greatly in excess of the requirements of the body. On the other hand, a purely vegetable diet necessitates an excessive amount of saccharides to obtain the necessary nitrogen. These difficulties are gotten rid of by combining animal and vegetable foods so as to secure a proper proportion of the various nutrient ingredients. That proportion is obtained by taking about one of animal food to two of vegetable food. If the diet be too much of one or the other certain evils result.

The evils resulting from a dietary containing an excessive amount of fish are not so pronounced as those resulting from too much "meat" or bird. It is thought that the evil is not due so much to an excessive amount of the proteid as to the associated extractives, though an excess in the proteids, especially if they belong to the nucleo group, may disturb the balance of the circulation by an excessive amount of waste. There are certain dietetic idiosyncrasies, some individuals being so constituted that they can consume an abundance of animal food without apparent harm, while others become rheumatic and gouty upon comparatively small quantities. As a rule, a superabundance of meat is apt to disagree during the earlier years of life; during middle life a highly animal diet is usually well borne; but after middle life animal food should be partaken of sparingly. The most important point to consider in choosing a diet is whether the life is sedentary or active. The more active, the larger the amount of animal food that can be taken with impunity. The inactive should consume a less proportion of animal food, though curiously enough they are less able to tolerate a purely vegetable diet than are those leading active lives. It is more difficult for them to burn off the excessive amount of sugar which such a diet contains. An individual may thrive on a purely meat diet even while resting in bed, especially if a large quantity of water be taken. The digestive system, relieved of the necessity of coping with the starch and other ingredients which a mixed diet entails, may be benefited by this plan of treatment. Such a diet can rarely be continued beyond a few weeks without doing injury unless a highly active life be led.

It is doubtful if health and vigor can be maintained upon a purely vegetable diet. Such diet may, because of its deficiency in proteids and stimulating extractives, lead to a lack of energy. Vegetable food has a tendency to ferment, and thus add to the distention caused by mere bulk. The cereals, pulses, and other vegetable articles tend to favor gout and rheumatism. The acids of fruits, while they may occasion joint pains, are usually oxidized into carbohydrates and eliminated in an alkaline form. Sugar is especially prone to undergo acid fermentation.

A vegetable diet fortified by vegetable proteids would overcome the objections to a purely vegetable diet. This would add the necessary nitrogen to the saccharides and would give a proper balance to the two varieties of food. Heretofore the so-called vegetarian has obtained the needed proteid from milk and eggs. Cheese contains, weight for weight, more proteid than meat.

The Cause and Pathology of Baldness: Dental Theory of Jacquet.—TREMOLIERES, F. *La Presse Médicale*, No. 48, p. 567, June 14, 1902.

The cause of baldness is much discussed, and frequent communications by dermatologists are found, in the reports of learned societies. The principal question is the contagiousness of this affection. It is not only of scientific interest, but is of some social importance. If the theory of contagion is adopted, of necessity some hygienic reforms must be instituted. Jacquet brought forward a theory of dystrophy based upon anatomical and physiological observations. At first he was convinced of the parasitic origin of baldness, but was later turned to the view that underlying most of the cases was a dystrophy. In many of the cases the possibility of contagion could be definitely excluded. He was finally forced to the conclusion that baldness is not a specific malady, but merely a symptom, sometimes of importance and again of little significance.

For a long time the coincidence of dental lesions and baldness had been remarked, but no one had established the relation between these two phenomena. In addition to the chronological relation of these two facts, he has shown that there is a topographical relation, giving to the morbid association of symptoms a peculiar stamp in which the alopecia is only one of the elements.

The chronological criteria include the subjective troubles in the region of disturbance of the fifth nerve, congestions accompanied by pain, or those in which it is absent, and again, simple neuralgia, such conditions being followed by falling of the beard, or hair, sometimes in small areas, and again disseminated. A patient with a bald spot upon the left side of the face complained of a violent neuralgia affecting the teeth upon the same side three months before. Another with disseminated baldness spoke of bilateral pains in the teeth some time before it appeared. A third having a neuralgia exclusively localized on the right side of the head and face, and severe pains in the right second molar, presented a bald area in the right temporofrontal region.

Without multiplying examples, it is sufficient to say that the troubles with the hair commonly appeared within from three weeks to three months after the neuralgic symptoms. Of 200 cases, Jacquet was able to present 27 in which this relation was clearly established. In others the associated symptoms were less pronounced, and possibly may have been forgotten by the patient.

When the teeth are involved upon the right side, the baldness appears upon the right side. Where the pain appears upon both sides, the baldness involves both sides. Neuralgia is the most obvi-

ous subjective symptom, but in addition the careful clinician notes vasomotor phenomena, alterations in sensation, and trophic disturbances more or less accentuated. Frequently there is localized slight erythema. Disturbances of sensation, characterized by increased temperature perception, or a decrease, are often noted. Adenopathy, especially submaxillary, is not uncommon, and occasionally enlargement of the tonsils, so as to constitute a veritable angina, is noted. When there is no spontaneous pain, there is often tenderness along the branches of the trigeminal, which is often homolateral with the baldness.

Gastric Conditions Found in Forty Healthy Persons. — CHASE, R. F. *Philadelphia Medical Journal*, vol. ix, No. 24, p. 1064, June 14, 1902.

This study was carried out upon forty students, all of whom, with the exception of three, regarded themselves as free from gastric disturbance. In each case the subject was instructed to fast from the evening meal until the examination the next morning. Then an Ewald test-meal — 35 grammes of bread and 300 cubic centimeters of water — was given. At the end of one hour the stomach contents were removed with a suction bulb. Water was then poured into the stomach until there was full distention, when the amount was recorded. The stomach was then moderately distended with air, the quantity required being noted. The area of the stomach resonance and the relation of the greater curvature to the umbilicus was noted.

The amount of stomach contents varied from 30 to 190 cubic centimeters. In twenty-three cases the lower border of the stomach was found above the umbilicus, and in sixteen it was at or below it. It was assumed that the stomachs under examination were normal, but the possibility of there being dilatation with atony, without subjective symptoms, seems reasonable. This was shown in the case of a young man of nineteen, a large eater and drinker. His capacity for air and fluid was abnormally large, and the greater curvature of the stomach was three-fourths of an inch below the navel. The amount of contents was 140 cubic centimeters, and the reaction to the iodoform test was delayed nearly one hour.

The xipho-umbilical resonance averaged four and a quarter inches, the maximum being six and one-eighth inches and the minimum two and a quarter. In the latter case the liver was abnormally low.

The stomach resonance to the right of the median line averaged

two and a quarter inches, the maximum being three and a half and the lowest one and a half.

The average amount of fluid that fully distended the stomach was 1290 cubic centimeters, and the smallest 400 cubic centimeters. Less reliance is to be placed upon this test than upon inflation and percussion in estimating the size of the stomach. The mean amount of hydrochloric acid was 1.7 per thousand; the highest acidity was 3.6 and the smallest was .8. In several cases no free hydrochloric acid was detected.

In discussing the findings, the writer says that according to the Ewald dictum pathologic conditions must have been present in half of the cases. It cannot be denied that pathologic changes may have been present in the stomach walls, but it is important to note that such conditions caused no gastric disturbance. The result of the investigation shows the wide limits that may be met in normal cases. If subjective symptoms had been present, they would probably have been attributed to the conditions found on examination.

Typhoid Spine; Spondylitis Typhosa; Perispondylitis Typhosa —CUTLER, E. G. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 26, p. 687, June 26, 1902.

Analysis of Twenty-six Cases of Typhoid Spine.—LORD, F. F. *Boston Medical and Surgical Journal*, vol. cxlvi, No. 26, p. 689, June 26, 1902.

Cutler refers to a condition of the spine resembling Pott's disease which occasionally follows typhoid fever, but without the characteristic deformity. There is usually severe pain and stiffness of the back. The complication occurs more frequently after convalescence, though it may be as late as three months after the disease has subsided. The chief symptoms are stiffness and pain in the back, with tenderness on pressure, the latter being the least constant. There are certain nervous manifestations, and sometimes the patient is hysterical. The patient described by Cutler was under treatment for typhoid fever and an ear complication from November 24 to February 24. When discharged he had a slightly raised, red, fluctuating mass over the right sacroiliac synchondrosis. The temperature was normal for twenty-four days. The lumbar region had been weak ever since his recovery from the fever. He could walk slowly, but had a dull ache in the left iliac bone. He had to lie flat on his back for an hour or two after going to bed. He rose to a sitting position with some difficulty and propped himself up with his hands. On leaning forward from the upright position the whole

spine moved as one piece. There was slight prominence of the third, fourth, and fifth lumbar, and upper sacral vertebræ. When the patient was lying on the abdomen there was limitation of the spinal movements backward, with slight muscular spasm. A carefully fitted leather jacket relieved the pain and the patient was able to move about more freely. Nine months after beginning treatment the patient reported himself well, having gained in weight, his appetite was good, and he was able to return to his employment.

Lord analyzes the twenty-six cases of typhoid spine reported from 1889 to 1902. Twenty-two out of the twenty-six were in men. A mechanical strain is mentioned in six cases. An initial symptom in all cases was pain. The time of onset varied from the end of the fever period to three months after defervescence. There were muscular spasms in three cases, radiating pain in ten, disturbance of sensation in the lower extremities in two, anesthesia in two, increased knee-jerks in seven, absence of knee-jerks in two, hysteria in three, neurasthenia in three, and a rise of temperature in ten. Spinal deformity was absent in ten cases, present in eight, and not mentioned in eight. In all but one it involved several vertebræ. Scoliosis was present in two cases, in one associated with a kyphosis.

The Influence of Flies in Spreading Typhoid Fever.—Lord, C. E. D. *Journal of Medicine and Science*, vol. viii, No. 8, p. 253, July, 1902.

Since the U. S. Army Commission investigated the spread of typhoid fever in military camps in the Spanish war, considerable attention has been paid to the common house-fly as a disseminator of this disease. Prof. L. O. Howard, as early as 1895, considered the question of the development of the house-fly in human feces, and came to the conclusion that they did not develop in this medium. Since then experiments conducted under different conditions have shown that they do develop, but the most natural habitat for the development of the house-fly is horse manure. This is the breeding ground of probably 95 per cent of the flies in a community. The female house-fly lays approximately 120 eggs. Eight hours is sufficient for the development of the larval state, in which the fly passes five days. In the pupal stage it passes another five days. Other flies breed in the excrement of both animals and man, but they may be practically disregarded, as the common *Musca domestica* composed 98.8 per cent of 23,087 flies caught in the rooms in which food supplies were ordinarily exposed.

Infective material may be conveyed by contamination of the body of the fly, particularly the feet, which are so constructed as to effectively convey adherent material. Flies may feed upon infective material and transport the infection in their digestive apparatus.

The writer especially emphasizes the necessity of disinfecting the urine in typhoid, as the germ frequently persists in this excretion long after convalescence has been established. In addition, the discharges from the bowels should be disinfected. Nothing is better for this purpose than slaked lime in the proportion of one to four parts of water. Access of flies to the patient or excreta should be prevented. Access of flies to privies should be prevented by covering all excreta upon deposit with earth, or better, lime. To diminish the flies, it should be remembered that 95 per cent of all flies seek horse manure to deposit their ova, and bearing this in mind an effort should be made to remove this material from the streets and alleyways to some place where it can be disposed of properly before the ova have had time to hatch.

The Pathology of Postdiphtheritic Paralysis.—LASLETT, E. E. *Journal of Pathology and Bacteriology*, vol. viii, No. 2, p. 228, June, 1902.

Mouravieff, in experimental work upon guinea-pigs with the diphtheria bacillus, claims that there are well marked changes in the nerve cells. The first alteration is a disintegration of the chromatic substance. Isolated cells perish, but a number reëstablish themselves. During the first three or four weeks there was no modification in the peripheral nerves. The explanation offered of this is that the diphtheria toxin produces a modification in the cells of the spinal cord, and later, as a result of these changes, the peripheral nerves undergo a degeneration and paralysis ensues. Martin found marked nerve degeneration, but no changes in the cord or spinal ganglia. Batten examined the nervous system thoroughly in six cases of diphtheritic paralysis, and found the nerve cells normal both in the spinal cord and posterior root ganglia. Rainy is of the opinion that the cellular changes are the most characteristic, while Bielschowsky and Nartowsky from recent experimental work concludé that the essential lesion is a parenchymatous degeneration of the peripheral nerves, and that the slight changes in the anterior horns of the spinal cord are secondary.

The writer's material includes four cases of diphtheritic paralysis of the diaphragm. He employed Marchi's and Nissl's stain. The whole cord is examined in all the cases, but there were no changes found, with the exception of a slight vascular engorgement. There

was complete absence of round-cell proliferation. There was slight degeneration of the posterior roots, but no ascending degeneration of the posterior columns. The phrenic nerves in all four cases showed marked degeneration. The myelin sheath had disappeared to a great extent from many of the fibers, it being represented by black-staining granules at intervals. In some instances they were quite characteristic of Wallerian degeneration, but in others only one internode of the fibers showed these droplets, while neighboring internodes appeared quite normal. The diaphragm showed a considerable amount of degeneration, but normal fibers were in a decided majority.

In conclusion the writer says that in the paralytic stage of diphtheria the only important change is in the peripheral nerves. If there are any changes in the cells during the preparalytic state, they do not stand in a causal relation to the parenchymatous degeneration in the nerves. The latter is to be regarded as the primary lesion.

Fourteen Cases of Spastic Spinal Paralysis in One Family.—SPILLER, W. G. *Philadelphia Medical Journal*, vol. ix, No. 25, p. 1129, June 21, 1902.

Two patients of this interesting family group came under the observation of the writer. The patient and his second son had a spastic paralysis of the lower extremities with contractures and exaggerated reflexes. The disease commenced on or about the fifth year and always presented the same symptoms. In one of the cases it began as early as the eighteenth month. The disease has been almost as common among the women of the family as among the men.

Case 1.—The father of the boy described as Case 2, 32 years of age. He stated that the symptoms began when he was five years of age. At the present time the legs are not atrophied, the left foot is in an equino-varus position, but the right foot is less contracted. The left foot is shorter than the right, and the instep is high. The patient has very little voluntary movement of the toes and feet, and the weakness is especially marked on the left side. Sensation for touch and pain is normal everywhere. The knee-jerks are much exaggerated, there is ankle clonus, and the Babinski reflexes are both exaggerated on each side. The feet are tender and the gait spastic. The muscles of the upper extremities are well developed.

Case 2.—Boy of five years, the fourteenth in descent from his great-great-grandmother, who had the disease. The mother is

healthy, and three other children, aged two, four, and six years respectively, are apparently healthy. When the child began to walk at 18 months of age, he waddled, and had a tendency to fall backward, and from that time his feet began gradually to turn inward and he walked on the outside of his feet. When standing or walking the knees are retroflexed. The knee-jerks are exaggerated. The muscles are not atrophied, and those of the thighs and legs respond to the faradic current. Ankle clonus is present on each side.

Fatty Degeneration of the Myocardium.—Cowan, J. N. *Journal of Pathology and Bacteriology*, vol 8, No. 3, p. 177, June, 1902.

Of the diseases of the heart, fatty change has had as much attention as any. The bulk of the work has been done with reference to the clinical signs and symptoms, and comparatively little attention has been paid to the morbid anatomy. The larger number of papers dealing with this subject date back many years to a time when fatty infiltration and degeneration were not clearly differentiated. The evidence on which fatty changes have been demonstrated is often faulty. In some cases macroscopic examination alone has been relied on, while in others the microscopic examination of the fresh tissues, an unreliable method, has been employed.

Many hearts whose muscle seems normal to the naked eye are really the site of extensive fatty change, while in some instances a fatty degeneration, though wide-spread, may require an immersion lens to demonstrate it even in osmic-stained specimens. Examination of the cardiac muscle in osmic acid media has been neglected, so that statistical count of the frequency of fatty heart in various diseases is at the present impossible.

Fatty degeneration of the myocardium is of quite common occurrence; while marked cases give notable evidence of the change on macroscopic examination, in a majority it can only be diagnosticated with certainty by examining sections which have been fixed in osmic acid.

Three forms are met with. In one the fat is irregularly distributed throughout the muscle, occurring especially in those parts which are relatively little supplied with blood; in the second the change is diffuse and is produced by a toxic condition of the blood. Intermediate cases may be met with in which both causes are present. A third form is due to local toxic action.

So far as the microscopic evidence goes, the condition is a true

degeneration of the muscle cell, and besides the presence of fat, other changes are also found in the cell, involving the destruction of fiber bundles which leaves a marked impairment of contractile power.

Leucocytosis in Appendicitis.—LONGRIDGE, C. J. N. *Lancet*, vol. clxiii, No. 2 of vol. ii, p. 74, June 12, 1901.

Hematological examinations are of value in abdominal inflammations in estimating the severity and progress of the affection. It is not claimed that the leucocyte count will give an infallible indication of the presence or absence of pus. Such an indication is not of the most vital importance, as pus does not kill. Whether a morbid process is of increasing virulence or not is of the utmost importance, and on this question the leucocyte count throws valuable light. A progressive increase in the number of leucocytes may be taken as evidence that the inflammatory lesion is developing in severity, and may be reaching the stage of pus formation. Of even more importance than the quantitative count is the qualitative estimation of the leucocytosis. In almost every case where the polymorphonuclear cells are increased out of proportion to the other elements, it is very significant of an increasing virulence in the inflammation. In the hematological examinations we must always remember that there may be no increase in the leucocytosis in mild catarrhal inflammations of the appendix, also in cases of fulminating appendicitis where the resistance of the patient is too feeble to react to the toxemia. There is also no increase in the leucocytosis where there is an abscess of some standing which is walled off.

Pathologic Conditions of the Cranial Sinuses.—KIRKLAND, T. S. *Australasian Medical Gazette*, vol. xxi, No. 6, p. 299, June 20, 1902.

The writer, with the assistance of H. S. Stacy, who made the bacteriological examination, has studied the conditions found in the cranial sinuses in 100 cases that have come to autopsy in the Sydney Hospital. The cavities examined include the antra of Highmore, the frontal, ethmoidal, sphenoidal, and lateral sinuses, together with the middle ear, mastoid antrum, and cells. The studies extended over a year. During four months of that period an epidemic of influenza occurred, followed in a number of cases by a fatal form of pneumonia. The latter disease accounts for 22 out of 100 deaths, and in 11 of these cases one or other of the sinuses was involved. The sphenoidal sinuses contained pus in 8 of these cases and clear fluid in 3, so that there were 50 per

cent of the cases dying of pneumonia who had the sphenoidal sinuses implicated. Of the whole number of cases dying of various diseases, 35 were found to contain pus in one or other of the cavities. If the 22 cases dying of pneumonia are subtracted, there are only 13 cases left whose sinuses showed the result of a suppurative process. These figures show that the pneumococcus and its associates are largely instrumental in the production of disease of accessory cavities of the nose.

The Diagnosis of Infarction of the Kidney.—SCHMIDT, R. *Wiener Klinische Wochenschrift*, 15th year, No. 25, p. 643, June, 1902.

Embolism of the renal artery commonly causes disturbance of the bladder, either retention or incontinence of urine. Following the embolism there is more or less hyperemia in the necrotic area, which is accompanied by a vasomotor paralysis and polyuria. There is often a sudden albuminuria accompanied by pain, and not infrequently a hematuria. Both of these symptoms rapidly disappear. There is frequently considerable sediment in the urine, which may consist of the kidney epithelium, the latter being no evidence that there is not a kidney infarction. Vomiting is often an early symptom in cases of embolus of the kidney, due to heart disease. The temperature is sometimes due to resorption in the region of the necrosis.

SURGERY.

A New Method of Bone Grafting.—MORTON, A. W. *American Medicine*, vol. iv, No. 2, p. 55, July 12, 1902.

The methods of supplying the defects in bone which have heretofore been devised are unsatisfactory. In all methods it has been necessary to have an aseptic cavity and an intact periosteum. The decalcified bone plates of Senn are often found in a bone cavity years after they have been introduced, having formed no integral part of the bone structure, being merely foreign bodies. The purpose of bone grafting is to supply the continuity of long bones. With an extensive defect in a long bone, where the periosteum is destroyed, the only method of repair is to transplant a large piece of bone with periosteal attachments from a corresponding bone of some animal, so that its pedicle will have a good blood-supply. Such a deficiency is seldom in a position to make use of any of the adjoining bone structures.

This is the first successful case of bone transplanting by vascular

attachment from animal to man. The patient was 45 years of age, rather obese, and had sustained an injury to the end of the tibia. A septic inflammation set in which resulted in necrosis of the lower five inches of the bone; this was removed. The defect in the bone was supplied from a black-and-tan dog of medium size. In performing the grafting the periosteum was resected and the end of the bone freshened so that there was free hemorrhage. The dog was placed under ether, and the left foreleg cleansed and amputated just above the tarsus; the ulna was left one inch longer than the radius; the skin and muscles were divided by a longitudinal incision of four inches and left attached, except about three inches at the lower end, which was removed to the periosteum. The cut end of the ulna entered the cavity of the tibia one inch and was united with silver wire; the fibula was wired to the end of the tibia. The free part of the incision in the patient's leg was closed by stitches; this placed the dog's leg on nearly the same plane as the man's leg. The wounds were drained, as they were not aseptic. All the stronger tendons in the leg of the dog were severed by a subcutaneous incision; the wounds were dressed with gauze, and the other three legs of the dog were placed in plaster of Paris separately. The dog and the leg of the man were enclosed in a plaster cast. Spaces were left beneath the dog to prevent soiling, and a window was left at the wound so that the dressing could be changed. The plaster cast was made heavy and strong by embedding splints in it.

The man suffered little pain or inconvenience except for the first two or three days, when the dog was restless, and would attempt to move; the more the dog moved, the more pain was inflicted on the patient, and also on the dog. The latter soon learned this, so that it was not necessary to give him morphine after the fourth day. The patient's general condition greatly improved. To keep the dog tightly encased in the cast it was necessary to pack with cotton, as he lost considerably in weight. Five weeks later the cast was removed, and the skin and muscles were separated from the dog's leg and the two bones divided near the joint and placed in contact with the astragalus. The skin and deeper structures were united except at the point of drainage, which slowly closed by granulation. At the lower angle a fistula remained, through which a small fragment of one of the bones passed. This had been broken off at the time the dog was detached.

The results of this case, as seen in skiagraphs taken three months afterward, show callus around the bones. The patient walks about with a cane and has a useful leg. The case demonstrates that

deficiencies of bone in man can be successfully supplied by transplantations from the lower animals, the vitality of the graft being maintained by vascular attachment.

Motor Aphasia, Due to a Small Cortical Hemorrhage in the Region of Broca's Convolution; Trephining; Recovery. — HOTCHKISS, L. W. *Annals of Surgery*, vol. xxxvi, No. 1, p. 82, July, 1902.

The number of cases of hemorrhage which have been trephined followed by recovery are so few that any successful case is worthy of record. The case reported is one which resulted from indirect violence. The patient had fallen backward, a distance of about nine feet, striking forcibly upon the back of the head. He was picked up unconscious, and so remained for eight hours. Upon recovery he was dazed, there was difficulty in speaking, and he bled rather freely from the right ear. As his condition became worse, he was sent to the hospital. No paralysis was noted at this time, and the grip in the hands was strong. He was greatly depressed over his inability to speak. He recognized objects presented to him, and if asked if he knew what they were would answer "Certainly," but could not name them. He could not speak his own name. Certain words he used in place of others. The temperature was 101°. The physical examination of the chest and abdomen revealed nothing abnormal.

Two days after the injury he was able to apprehend clearly all that was said to him, to recognize objects shown him, but was unable to utter a word.

With a conical trephine the skull was entered at a point about one and a half inches behind the external angular process, and the same distance above the level of the zygoma. The dura mater beneath the opening was dark and pulseless. There was no hemorrhage outside the dura, nor any evidence of fracture of the skull in that region. The trephine hole was enlarged in a forward and downward direction, and the field occupied by the clot freely exposed. The dura was opened and some dark blood-clots removed. The hemorrhage, so far as could be observed, did not come from the vessels of the dura, but from small cerebral branches. The clot was firm and moderately adherent to the cortex of the brain. The flap of dura was replaced, but not sutured, provision being made for possible oozing.

Following the operation there was a slight convulsion of the right side of the face, and later one which involved the arm and leg. The following day the patient was able to speak some words. Four

days later he was out of bed and the speech was improving steadily, there only remaining some hesitation. He was able to give his name and address correctly. The later history of the case was a gradual disappearance of the dizziness and a return of confidence in his ability to speak. A couple of months after leaving the hospital he reported himself well, and speech was normal.

Resection of the Sympathetic for Glaucoma.—Von Ziehe and Axenfeld. *Vossius Sammlung Zwangloser Abhandlungen aus dem Gebiete der Augenheilkunde*, Bd. iv, Heft 3.

The writers have prepared a monograph based upon the study of all cases reported. They present the advantages and disadvantages of the operation in a judicial manner, but come to the general conclusion that extirpation of the sympathetic is of distinct value in the treatment of glaucoma, though there are certain contraindications. So far, seventy-four cases have been published. The whole subject is too recent to pass any definite opinion as to the permanency of cure reached by this method, but symptomatic improvements have been noted in a large proportion of cases. In the hands of a skilful surgeon operations upon the sympathetic are devoid of mortality; so far but one death has been reported. Occasionally slight paresis of the upper extremity and difficulty in swallowing have followed the operation.

The operation should not be done in cases of acute inflammatory glaucoma, excepting in those cases in which iridectomy will not be allowed by the patient, or in which it has been performed and the glaucoma has not been improved, or it has recurred. In hemorrhagic glaucoma resection is not to be done, as the results are very uncertain. In simple and chronic inflammatory glaucoma the results have been good, particularly those following an iridectomy. In general, this operation should precede that of extirpation of the sympathetic.

The Etiology of Postoperative Femoral Thrombophlebitis. — Clark, John G. *University of Pennsylvania Medical Bulletin*, vol. xv, No. 5, p. 154, July, 1902.

In a table the writer gives a clinical analysis of forty-one cases of thrombophlebitis occurring after abdominal operations. A femoral thrombosis may follow a simple abdominal operation. In fact, the gravity of the operation and the amount of shock attending it seem to have little influence in the development of this complication. Experimental investigation has contributed nothing of value, and the autopsy records have added little to our knowledge

of the condition, as these troubles are rarely fatal. In the table of cases this complication developed in two cases as early as the eighth day, and in one as late as the thirtieth day. The larger proportion of cases occurred between the eleventh and twentieth days. It is a relatively rare complication, as the above forty-one cases were all that occurred in a series of 3000 abdominal sections. The fact that the complication did not occur in plastic operations, excepting where abdominal incision was made, leads to the view that there is something in abdominal operations that causes the phlebitis. The complication is seldom if ever accompanied or preceded by a temperature. The theory of a septic phlebitis is negatived by the fact that those cases which are infected at the time of operation were represented by only two cases, while the surgically clean ones, such as myoma uteri and ovarian cystoma, overwhelmingly predominated. The time after operation at which the complication develops shows that it is not infectious.

These considerations lead the writer to the conclusion that traumatism, particularly those cases in which there must be heavy retraction, as in the delivery and operation upon fibroid tumors, adherent cysts, and cancer of the uterus, may directly injure the epigastric vessels, especially if the retractor makes firm pressure on the abdominal wall and the deep epigastric vessels are injured. A relatively large proportion of cases occur in the operation for suspension of the uterus where the ligature is passed out laterally in the position where it catches the epigastric vessels, or makes sufficient traction upon them to cause a thrombus.

Wiring the Bones in Fracture of the Pelvis.—HUEY, J. J., and STEVENS, B. C. *Lancet*, vol. clxiii, No. 2 of vol. ii, p. 77, June 12, 1902.

The writers, in the report of the Mexborough Cottage Hospital, describe a case of compound comminuted and complicated fracture of the pelvis, in which there was marked displacement of the bones, which was successfully dealt with by wiring. The patient had been injured in a wreck. The shock was not marked, but there was much pain and tenderness over the groin and hip. There was an incised wound three inches long in the left groin, which opened the inguinal canal. The anterior third of the iliac crest was loose. In exploring the wound with the finger, the whole left side of the pelvis was found to be altered and some serous fluid escaped. The pelvic viscera were intact.

Under chloroform, the incision was extended up to a point where the anterior superior spine would normally have been. It was then

found that the fracture involved the true pelvis, the hip-joint was disorganized, and the pelvic ramus was quite loose. The head of the femur was in its normal place. From deep down in the pelvis a loose triangular piece of bone was hooked up by the fingers and brought in contact with a piece of the ilium and wired. This fragment of bone was in dangerous proximity to the bladder and iliac vessels, until it was brought up and fixed to the ilium. The muscular structures in the inguinal canal were sutured. The temperature continued high for twelve days, it being due to a bronchopneumonia. The upper part of the wound suppurated, and subsequently a small spiculum of bone came away. At the time the report was made the wound had healed, and the patient was walking around with the aid of a thigh splint. He could bear part of the weight of the body upon the pelvis. The writer strongly recommends the expediency of wiring fragments in severe fracture of the pelvis.

Circumcision in Young Infants. – GARDNER, J. A., and WILSON, N. W. *Buffalo Medical Journal*, vol. lvii, No. 12, p. 887, July, 1902.

The writers report upon eighteen cases of infantile circumcision. The oldest child was between three and four months, and the youngest but eighteen hours old. The open and closed methods were alternately used. In the former there was no suturing, the prepuce being merely trimmed back of the glans and the wound left open. All bleeding points were nipped with hemostatic forceps, the wound dusted with a mixture of orthoform and nitrogen, and covered with cotton. The others were sutured and dressed in the usual way. In every case where the open method was used there was less pain and discomfort, and more rapid healing. In cases where the sutures were used, the stitches apparently caused much irritation and restlessness. The results point clearly to the open method as the best in young children.

The Comparison of Nitrous Oxide and Ether with Plain Ether Anesthesia. — NORRIS, C. C. *University of Pennsylvania Medical Bulletin*, vol. xv, No. 5, p. 178, July, 1902.

The writer gives a composite chart of 150 cases of nitrous oxide and ether anesthesia. The duration of the administration was one hour, the time necessary to bring the patient under was $3\frac{1}{3}$ minutes, the total amount of ether required was 170.5 grammes, and the amount of ether necessary to anesthetize was 60 grammes.

In the 150 cases of ether anesthesia not preceded by nitrous

oxide the total amount required was 218 grammes, the time necessary to produce anesthesia was 13½ minutes, and the duration of the anesthesia was one hour.

The combined charts show that the effect upon the pulse was much more marked where ether alone was employed, the pulse rising from 90 to 120 during the first quarter-hour, and then falling to 100, where it remained throughout the anesthesia. Where nitrous oxide preceded inhalation of the ether, the pulse rose to 100 and then fell to 90; the majority did not go above 100. Attention is called to the fact that the time necessary to bring the patient under the anesthetic was ten minutes less where the nitrous oxide was used.

THERAPEUTICS.

Cancroine in the Treatment of Cancer.—KUGEL, L. *Berliner Klinische Wochenschrift*, 39th year, No. 34, p. 567, June 16, 1902.

Recent Experiences with Cancroine in Cancer of the Tongue, Larynx, Esophagus, Stomach, and Breast.—ADAMKIEWICZ, A. *Berliner Klinische Wochenschrift*, 39th year, No. 34, p. 569, June 16, 1902.

Kugel reports the case of a woman 53 years of age who some ten years ago noticed a small tumor of the breast, which was extirpated. It returned three times, each time being removed, the last including a clearing of the axilla. The removed portion was examined and a diagnosis of cancer made in each instance. Two years ago a tumor appeared over the left clavicle which was closely related with the cartilages of the ribs. After this, pain and edema appeared in the upper extremity and cachexia was marked. As it was evident that the growth had become disseminated, no further operation was advised.

The first injection of cancroine was followed by immediate improvement in the pain and lessening of the edema, both disappearing after the twentieth injection. At the end of three months the injections were given every second day, and later the interval was increased. The tumors decreased somewhat in size, but afterward remained stationary for a time, ultimately disappearing, leaving on the site some change in the skin, which was not as flexible as normal. In the last four and a half months there has been no local change. The patient's general health and appetite have improved, and there has been a gain in weight.

Adamkiewicz reports the case of a woman with cancer of the

tongue. The disease had advanced so far that the patient was unable to speak understandingly and was scarcely able to swallow. The patient was given the first injection of cancroine on January 21, which produced a good reaction. There was swelling of the tongue. By February 12 there was only a slight thickening of the tongue to be noted. The speech had improved and the patient was able to eat. The disease, which had lasted three years, was cured in eight weeks, it requiring only sixteen injections. On the 20th of April metastasis on each side of the tongue had disappeared, the infiltrated portions of the tongue were absorbed, and the organ returned to its normal size and appearance.

A case of cancer of the larynx is reported by Dr. Tutterlin in which tracheotomy had been necessary. This patient, who was in a low condition, improved rapidly after the cancroine had been injected for a month. He had formerly been unable to swallow, but after the injection the tumor mass so far lessened in size as to permit him to take liquid food.

In a case of cancer of the esophagus which during the year 1901 had produced a progressive inability to swallow, an operation for gastric fistula was performed in January, 1902. On the 13th of March injections of cancroine were begun. These were followed by pain in the region of the growth, which was just above the cardiac opening of the stomach. In addition there was vomiting. This was followed by an improvement in respiration, which had been somewhat embarrassed. On March 16 small quantities of fluid could be swallowed, and three days later the patient was able to swallow a small quantity of bread.

Another case was that of a woman 38 years of age suffering from cancer of the stomach, which began in August, 1901. There was the general loss of strength, and pain, with vomiting. A diagnosis of cancer of the stomach was made by Nothnagel. At the time she came under treatment she had taken no solid food for seven months. All that she was able to take was a little milk and soup, and these in small quantities. After the first injection of cancroine vomiting ceased. After this the patient was able to take food in large quantities, the strength returned, and on the 24th of March, less than a month from the time treatment was begun, the patient was apparently well.

A patient 38 years of age, suffering from carcinoma of the breast, was operated on in February, 1900, and again in May, 1901, after a return of the disease. At the time she came under observation, February 12, 1902, the subclavicular glands were involved,

and in the old scar was a growth the size of a hazelnut. Another growth was noted on the side of the thorax. The left arm was edematous and painful. The patient was weak, thin, and anemic. On February 17, 1902, the injections were begun and continued for about three months. Some of the tumors disappeared rapidly, but others only after prolonged injections. Ultimately the patient made a good recovery, with an apparent arrest of the disease.

The General Treatment of Tuberculosis of Bones and Joints.—GALLOWAY, H. P. H. *Canadian Journal of Medicine and Surgery*, vol. xii, No. 1, p. 13, July, 1902.

In treating tuberculosis of the bones and joints, rest is of prime importance. In discussions in the text-books there is a general neglect of those conditions of environment and of general nutrition which materially favor the restoration of a tubercular process wherever located. Too often surgeons think that the application of a suitable splint or brace meets all of the indications in chronic joint disease. The profession has begun to realize that fresh air, sanitation, and proper food and clothing are more important than all other measures in the prevention and cure of pulmonary tuberculosis. Judging by our writings, and possibly, to some extent, by our practice, we are still largely unconscious of the fact that proper environment and the measures for general invigoration and increase of resisting power, which experience has shown to be so useful when tuberculosis has attacked the lungs, are urgently called for if we expect the best obtainable results when this infection is located in other tissues.

In the general treatment of tuberculosis of the bones and joints, drugs occupy an unimportant place. Tonics, such as iron in small doses, are sometimes of service. Cod-liver oil during the winter months is often beneficial, but good sweet cream is perhaps even more useful. Milk, cream, and butter of the best quality should enter largely into the dietary along with such staples as oatmeal porridge, whole wheat bread, and beef. In general, the diet should be simple and nutritious, and it is especially necessary to intelligently adapt the patient's food supply to his digestive power and eliminative capacity. The wisdom of blindly encouraging every tubercular patient to swallow large quantities of highly nutritious foods without carefully considering his ability to assimilate them should be doubted. Every agent should be employed which will fortify the patient's constitution. The more nearly a patient can be brought to a continuous outdoor life without the inconvenience of

such a mode of living, the better. Sanitarium methods indisputably furnish the best results in bone and joint tuberculosis. This means that the poor cannot generally be treated at home, and in the well-to-do even there must be special arrangements for the treatment of the case.

Over a year ago experiments in treating patients in tents were begun in the Toronto Orthopedic Hospital. From May 15, 1901, to May 15, 1902, 25 cases of Pott's disease, 13 cases of hip-joint disease, 6 cases of tuberculosis of the knee, 4 of the ankle, and 1 of the elbow were thus treated. The shortest period spent in the tent was one day, and the longest 343 days. In general, the behavior of those patients living in tents, especially when compared with their previous progress, was favorable to tent life. The response to the change is usually immediate and pronounced. In most cases a distinct improvement in appetite is observed within twenty-four hours. The patients almost immediately begin to put on flesh, and the mental tone is improved. A fact worthy of mention is that the general health of the nurses who are on duty in the tents undergoes a distinct and favorable change. It would be an error to look upon fresh air and sunshine as substitutes for surgical and mechanical means, but they form an excellent adjuvant to surgical measures. It is a surgeon's first duty, when consulted in cases of hip and spine disease, to realize that he is being consulted by a patient who has tuberculosis. In proportion to the clearness with which this idea is defined in his own mind will the surgeon be able to take a comprehensive grasp of the present and future needs of the patient.

Treatment of Tinnitus Aurium.—Lewis, G. G. *Philadelphia Medical Journal*, vol. ix, No. 26, p. 1163, June 28, 1902.

The writer discusses the general subject of tinnitus, and emphasizes the importance, as a basis of treatment, of the underlying factors in each case. The general principles of prognosis are the longer it has existed and the more unvarying its character, and the higher the pitch, the less promising. That due to acute trouble is usually temporary, while that caused by structural changes or chronic affections is apt to continue through life, it being constant or intermittent. In some cases, after years of annoyance, when deafness becomes complete, it ceases, a circumstance which is probably due to the loss of functional activity of the auditory nerve. The prognosis is bad if massage of the membrana tympanum does not diminish the increasing noise.

The proper treatment of tinnitus depends upon an understanding of the underlying condition. Counter-irritants behind the ear are only occasionally beneficial. The same may be said of electricity, either galvanic or faradic. Inflation of the tympanum may be of value in cases of tubal catarrh, or middle-ear disease. Perforation, or removal of the tympanum, may benefit those with ankylosis, or adhesions of the ossicles, or with thickened or immovable membrana. This procedure, however, exposes the middle ear to the action of the atmosphere, which is prone to set up inflammation. Removal of the ossicles may be of temporary benefit when they are ankylosed or necrotic, by decreasing the tympanic pressure and permitting sound waves to come in contact with the oval window. Such operations should not be performed if the tones heard are of high pitch, indicating the involvement of the internal ear. The vapors of chloroform, iodine, sulphuric ether, menthol, and similar substances introduced into the tympanum promote absorption of the tympanic bands in many cases. Tinnitus of vascular origin is sometimes benefited by freezing the mastoid area with chloride of ethyl spray. Massage of the membrana tympanum and ossicles by the use of Siegel's otoscope, Lucae's pressure probe, Delstanche's or Wigmore's masseur is beneficial in adherent ossicles or membranes. The best of the aural masseurs is Wigmore's. Of late, the Bavarian aurists claim marvelous results from compressed air, by which the membrane is forced violently inward by strong pressure. It has been noted in the Hudson River tunnel, where the air-pressure is forty-five pounds to the square inch, that hearing has been restored in workmen who were previously deaf. Among the internal remedies, hydrobromic acid has been lauded. It is the best remedy for internal administration and overcomes tinnitus due to vascular irritation, especially if it is associated with vertigo. It should be given in ten- or fifteen-drop doses three times a day, largely diluted. Pilocarpine is useful in recent cases of exudate within the labyrinth. Many leading foreign aurists now recommend quinine in periodic vertigo. They administer it in small doses once or twice a day, just sufficient to improve the circulation and relieve the aural anemia.

Trunecek's Serum.—Levi, Leopold. *La Presse Médicale*, No. 49, p. 579, June 18, 1902.

Numerous writers have contributed recently to the French press favorable reports upon the use of Trunecek's serum in the treatment of arterial sclerosis. The serum is composed of salts which resemble

in composition those found in the blood serum. Hayem's serum is slightly different from that of Trunecek, but it is probable that their physiological action is much the same. Sometimes the serum is given by the rectum; again, and most often, it is administered hypodermically. If administered by the rectum the absorption is uncertain, as frequently there is marked intolerance of the injections. The most marked improvement has been obtained in those cases in which it is used under the skin, the initial dose being five cubic centimeters, this being gradually increased until thirty or forty cubic centimeters is injected. The larger injections are frequently followed by local disturbances and irritation, and in patients whose general vitality is reduced an abscess occasionally forms, even in cases in which antiseptic precautions are employed. These objections to the use of Trunecek's serum and Hayem's serum led Levi to prepare a serum which should be given by the mouth. He uses the following formula in what he calls *poudre minerale:*

Chloride of sodium	10. grammes.
Sulphate of sodium	1. gramme.
Phosphate of lime	0.75 gramme.
Phosphate of magnesia	0.75 gramme.
Carbonate of sodium	0.40 gramme.
Phosphate of sodium	0.30 gramme.

This powder is divided into thirteen parts, each of which contains about one gramme of the mixture. One of these powders is taken in a considerable quantity of water an hour before breakfast, another an hour before the midday meal, and a third an hour before supper. In some cases it acts upon the bowels and causes a little uneasiness in the stomach, in which event a drop or two of laudanum may be added to the dose. The writer reports what are certainly brilliant results in the administration of this powder, though the diagnosis of arterial sclerosis is by no means supported by the cases which he describes. In the main they seem to be patients whose elimination was low, suffering from headache, dizziness, and noises in the ears.

A New Method of Performing Vaccination.—Borgey, N. *Semaine Médicale*, 22d year, No. 27, p. 218, July 2, 1902.

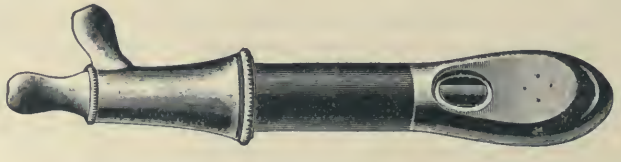
The failure of vaccination in a given case is attributed in the majority of cases to some defect in the virus, or to a natural immunity of the individual. The writer thinks that too little importance has been attached to the method used in inoculating the person with vaccine virus. The fact of natural immunity is even thought to be transmissible from the mother to the infant,

and to account in a large measure for the number of cases of first vaccinations which fail to "take." A more efficient method of introducing the virus would result in a much larger proportion of successes.

To prepare a surface for the absorption of the virus, the writer recommends a small instrument made of copper having a surface of about one-half centimeter. This is heated in hot water to the boiling point, and then held in contact with the part for two or three minutes. There results a reddening of the surface and the raising of a small blister. The inoculation is then made directly into the serum which is formed under the separated epidermis. The latter is said to furnish a favorable culture medium for the vaccination virus, and to result in the majority of cases in typical vesicles. Some of his cases had been vaccinated shortly before with no results, and some within a year had been successfully vaccinated, but still showed a typical reaction when the virus was introduced in this way. The number of cases in which it has been employed is too few to draw definite conclusions, but theoretically it has much to commend it, as it denudes a surface of the epidermis, there is no hemorrhage, and the conditions are as favorable as they can possibly be for absorption. The writer claims the same degree of success in this method that is achieved by the introduction of the glycerinated lymph hypodermically. The latter, however, is accompanied by a severe inflammatory reaction in some cases, and it will never prove to be a popular method.

Heat in the Treatment of the Prostate.—Dowd, J. H. *Buffalo Medical Journal*, vol. lvii, No. 12, July, 1902.

Moist heat is of greater value in the treatment of inflammation of the prostate than is dry heat. So far, the instruments devised for treating the prostate with heat have been closed tubes. An instrument figured by the writer brings the solution in contact with the parts, which permits of a certain amount of osmosis, a



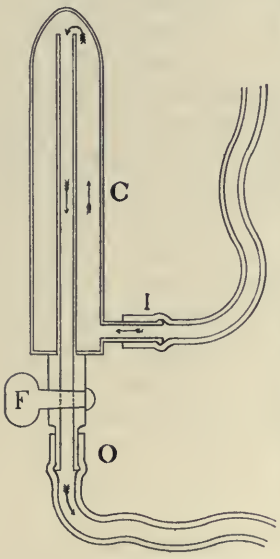
valuable element in the treatment of inflammation of these structures. In the instrument which he has devised the part in contact with the sphincter is of hard rubber; being a non-conductor, higher

temperatures can be used than with all-metal instruments. After the prolonged application of heat a suppository is introduced composed of

Ichthyol	2 drops.
Extract of belladonna	¼ grain.
Extract of hyoscyamus	1 grain.
Potassium iodide	1 grain.

Heat in the Treatment of Pruritus Ani. — ANDREWS, EDMUND. *Journal of the American Medical Association*, vol. xxxix, No. 2, p. 74, July 12, 1902.

The value of a high degree of heat in the treatment of pruritus ani has long been recognized. Systematic writers upon diseases of the rectum, in referring to pruritus ani, speak of bathing the parts in very hot water, and the use of hot douches. It is very difficult to bring heat in contact with the parts unless a special apparatus such as that shown is devised. It consists of a simple cone, the outer jacket of which has an inlet pipe by which the hot water is conveyed to the lower portion of the apparatus, it flowing from a central outlet pipe at the apex of the cone. Some patients tolerate quite high degrees of heat, in some as high as 140° F. having been employed. Many patients cannot endure a temperature above 125°.



A full-length hot bath cannot be used above 105°, but small local spots bear for a short time these higher temperatures.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Examination of the Gastric Contents in Children.—FISCHER, L. *Medical News*, vol. lxxxi, No. 1, p. 13, July 5, 1902.

In examining the gastric contents of children, a Nélaton catheter was introduced into the stomach and the gastric contents siphoned off. This examination was made if there was a poor appetite or a subacute dyspepsia. In children under one year, fed at the breast or on the bottle, the time chosen for siphoning was from one to two hours after feeding. The largest number of examinations were fur-

nished by specimens of vomit secured by the nurse. From this material the writer concludes that in atrophic children, and in subacute dyspeptic conditions, hydrochloric acid is absent. The organic acids, lactic and butyric, are present. There was acidity in all anemic conditions, also in that form of disease resulting from malassimilation known as athrepsia infantum. The motility of the stomach was found to be greatly reduced in these conditions.

In young infants, especially healthy nurslings, there is an excess of lactic acid at the commencement of digestion until after the sixth year. Free hydrochloric acid can be found at the end of the digestive process, in the same proportion as in adults. In healthy children of over one year, free hydrochloric acid is found one and a half hours after feeding. At the beginning of the digestive process lactic acid predominates; at the end of digestion hydrochloric acid is in excess. There is a constant antagonism between lactic and hydrochloric acids. Where gastroenteric disorder existed in which both stomach and intestines participated, free hydrochloric acid could not be found.

The gastric contents of children fed on raw milk warmed to body temperature always showed a better state of digestion than did those of children fed on milk which had previously been subjected to superheating. After the ingestion of sterilized milk the stomach contained hard, rubbery lumps two or three hours after a meal. Constipation was an invariable accompaniment after the use of sterilized milk, and it frequently disappeared when raw milk was used.

Hydrotherapy in the Treatment of Incipient Bronchopneumonia in Infants.—ZANGGER, T. *Lancet*, vol. clxii, No. 26 of vol. i, June 28, 1902, p. 1826.

The writer thinks his experience justifies the assertion that the proper application of hydrotherapeutic measures will result in aborting a bronchopneumonia in children. Bronchopneumonia is a frequent complication of whooping cough, measles, and other diseases of children. It is a condition often covering a period of from four to six weeks, and frequently leaves the children in a lowered state of vitality, from which a perfect recovery is scarcely possible; hence, any method which tends to limit the duration of the disease should receive full consideration.

The method is described in the first case history. The child was four years of age, and lived under unhygienic conditions. She was taken ill with a rash which was diagnosticated measles. On the

fifth day the temperature, which had gone down, rose again to 103°, the child was somnolent, the heart's action rapid, and the number of respirations increased. There were small, non-crepitant râles, and dulness on percussion over the lower and posterior part of the right lung. Incipient pneumonia was diagnosticated, and a "half-bath" with friction was ordered. The temperature of the bath was 86° F., and was then decreased slowly to 76°. The following morning the child was improved, and no second bath was ordered, the temperature remaining normal.

The writer only refers to those cases in which hydrotherapeutic measures were resorted to alone, because he desires to emphasize the importance of the bath in treating bronchopneumonia in children. He does not contend that drug treatment is devoid of value, but thinks they can be combined with advantage. Comparatively little service is obtained from the baths if they are resorted to late in the disease, but employed in the incipient stage they often abort the disease. The baths can be varied in duration according to the age of the patient and the severity of the symptoms. As a general rule, packs have not given as good results as the bath. In starting with the baths the writer prefers a simple and well defined technique which can be varied to suit the individual indications. The first bath should usually be supervised by the physician, and it is often well to administer a stimulant before the bath is given.

Vaginal Incision for the Relief of Pelvic Abscess. — NORRIS, C. C. *University of Pennsylvania Medical Bulletin*, vol. xv, No. 5, July, 1902.

The common name vaginal puncture for describing this operation is misleading, as it implies making a small opening into an abscess. The operation is essentially free incision and drainage. If the abdominal route is used exclusively for pus cases a high mortality follows, although abdominal section is unquestionably the best method of dealing with the majority of these cases. Vaginal incision has its proper place in pelvic surgery, particularly where the patient is in a low state, the pulse rapid and weak, the temperature high, and the abscess bulges directly into the vagina. Even if the condition is moderately good, vaginal incision is the operation of election, but if the condition is bad it is the only operation that can be attempted with a hope of saving the patient. One of its advantages is the speed with which it may be performed, it rarely requiring more than five or ten minutes. Vaginal incision is a life-saving measure, but it should be borne in mind that it is not curative; it does not preclude the possibility of a thorough operation later,

after the patient's health has been improved. The shock due to the evacuation of the pus, in vaginal incision, is slight, compared with that caused by a laparotomy.

The cases in which vaginal incision is practicable are: (1) Abscesses in Douglas's cul-de-sac; (2) puerperal perimetritis or cellulitis; (3) extra-uterine pregnancies, ruptured, or completely walled off by exudates and adhesions; (4) pyosalpinx and hydrosalpinx. In the first of these cases it is the operation of election, and in the second class it is the best in most cases. In extra-uterine pregnancies it is only to be done where the rupture is of long standing, the flooding has entirely ceased, and the gestation products are surrounded by adhesions. In the cases of pyosalpinx and hydrosalpinx, vaginal section is not the operation of election in the majority of cases, but in some instances it may be employed where the condition of the patient is such as to render a long operation out of the question.

Thyroid Extract in Painful Menstruation.—STIMSON, J. C. *American Journal of Obstetrics*, vol. xlvi, No. 1, p. 63, July, 1902.

The writer discusses the use of thyroid in dysmenorrhea and ovarian neuralgia. The difficulty in curing these cases is that their impressions of pain become more marked as time goes on, and nothing so increases their susceptibility as the use of opiates. All cases of dysmenorrhea are somewhat relieved by rest, recumbent posture, hot applications to the lower extremities and abdomen, and hot douches. Many patients cannot afford to lay up for several days each month.

In thyroid we have a remedy of much value in these cases. Marked systematic effects are produced by medium doses of thyroids, the pulse rate is increased, arterial tension is lessened, and the accompanying loss of weight shows that there is increased tissue waste. In 1901 a patient consulted who for years had suffered with pain at each period, during which time she was laid up. The usual remedies and drugs that are of accredited value in dysmenorrhea were given with no results. An examination of the pelvis and abdomen showed the uterus and ovaries in normal position and in good condition. Dilatation of the uterine cervix afforded temporary relief. Because of obesity the patient was put upon thyroids, which was followed by complete relief of the menstrual difficulty. At each menstrual period since complete relief has been obtained by the administration of thyroidin. Since this case the writer has repeatedly employed thyroidin in painful menstruation, and it has given

relief in a large proportion of cases. Of course, all pathologic lesions of the uterus and adnexa should be remedied by proper surgical treatment.

Vascular Pressure in Children.—Kolossowa, Anna. *Archives de Médecine des Enfants*, Tome v, No. 7, p. 421, July, 1902.

The writer has studied vascular pressure, as measured with the tonometer of Gaertner, in 340 children. She has determined that there is a progressive increase in the average vascular pressure at different age periods from the first year to puberty. The pressure in the first two years of life averages from 80 to 85 millimeters, in the third and fourth years 85 millimeters, from five to seven years 90 to 95 millimeters, eight to ten years 95 to 100 millimeters, eleven to thirteen years 100 to 110 millimeters.

In 115 cases of diphtheria there was ordinarily noticed a slight fall in vascular pressure, which again became normal after convalescence. In cases of diphtheria complicated by albuminuria, an increase of pressure was found which was directly related to the quantity of albumin. In cases of diphtheria complicated by paralysis, there was marked diminution of pressure coincident with the development of this complication. In fatal cases there was a progressive loss of vascular tension until death. The temperature was not related to the artificial pressure. In some cases with a higher temperature increase of tension was noted, while in other cases there was a marked fall in vascular pressure with or without fever. If bronchopneumonia developed, the pressure commonly increased. A number of cases of scarlet fever and measles were studied, in which, like in the diphtheria, it seemed the rule that a diminution of pressure was a criterion of the degree of intoxication.

Treatment of Athrepsia.—Narbel, A. *Archives de Médecine des Enfants*, Tome v, No. 7, p. 401, July, 1902.

By the term *l'athrepsie*, the writer understands that defect in nutrition which was described by Parrot under the term *atrophia infantum*. The German school has designated these cases as intestinal cachexia. Parrot understood by athrepsia a malady having a well marked clinical course, accompanied by appreciable anatomical changes, mostly of the intestinal tract.

The treatment of this condition is, in the main, unsatisfactory, but the writer has achieved excellent results with a comparatively new remedy known as lecithine. This is prepared from the yolk of eggs, and is a concentrated albumen sold under the above term as a trade name. The substance is injected beneath the skin in doses of

about one cubic centimeter every second day. Usually after beginning the injections there is an improvement in the appetite and nutrition and a marked gain in weight. It was especially noted that there was a functional improvement in the digestive tube, the appetite returned, and there was a gain in weight. Lecithine is to be had in collapsible sterilized tubes; in this form it may be directly injected into the muscles of the back or thigh with an ordinary syringe. The injections are not followed by a local reaction.

Deep Transverse Arrest of the Head as an Indication for Forceps.—REED, C. B. *Annals of Gynecology and Pediatry*, vol. xv, No. 7, p. 402, July, 1902.

This complication occurs in 1.26 to 1.5 per cent of labors. In the last 3600 labors in the Chicago Lying-in Hospital it was recognized 34 times, but owing to the practice prevailing in this institution it is probable that some cases which spontaneously rotated were not noticed. The percentage in this institution was .97. It is said to be more frequent in primiparæ, but this is not borne out by the cases in the Chicago Lying-in Hospital. These cases usually terminate favorably, but the condition of the child or the mother may necessitate early intervention. It was in this class of cases that the vectis found its greatest utility. In overcoming this difficulty, rotation and extraction are to be kept in view. The occiput should not be rotated forward directly as some advise, for fear of lacerating the vaginal walls, but traction and rotation must be simultaneous, in the proportion of two of traction to one of rotation.

Ovarian Irritation a Cause of Pseudocyesis.—SCHELL, J. T. *American Medicine*, vol. iv, No. 1, p. 26, July 5, 1902.

The possibility of ovarian irritation being the cause of spurious pregnancy was suggested to the writer by a study of four cases. All of these women were comparatively young, the eldest being only 33 years of age; hence the menopause, which is regarded by some writers as a condition favoring the development of pseudocyesis, could have played no part in these cases. The mental attitude was indifference as to the probability of pregnancy. One was nervous and hysterical. After the dissipation of the delusion of pregnancy there were more or less severe symptoms of ovarian disease. In two of the cases the advisability of operating upon the ovaries was discussed. The writer regards pseudocyesis as a mental disease, probably a manifestation of hysteria, but believes that pelvic disturbance is the source of the hysteria in most cases.

FORENSIC MEDICINE.

Liability of the Employer for Exposure to Special Infection.—*Journal of the American Medical Association*, vol. xxxix, No. 3, p. 160, July 19, 1902.

The Court of Appeals at Kansas City, Missouri, in the case of Nickel *vs.* The Columbia Paper Stock Company, has confirmed a judgment obtained by an employee who was made ill by sorting some rags which had been obtained from a hospital. It was shown that in the sack that came from the hospital there was cotton saturated with blood, medicines, and wound secretions, and there were pieces of decaying flesh. By reason of the exposure to this infection she was made ill, and brought suit against the defendant company.

The court in commenting upon the case said that the company should have exercised care to protect the health of the employee; that the employee took the ordinary risks of the occupation, which at best were not inconsiderable; but that the company was culpable in putting on her work-table a bundle of poisonous waste matter gathered from a place where such poisonous materials might reasonably be expected to be found. The exceptional character of the occurrence was enough to demonstrate that she should not be required to assume the risk. If the foul and poisonous material was collected by agents for whose acts the company was responsible, then it should answer for the consequences. If the material was collected without the company's knowledge or authority, then common prudence would have dictated an inspection thereof, before handing it over for assortment. If the possibility was such that an injury as happened was likely to inevitably follow, then it was the company's duty to have warned this employee of the danger, or to have taken precautions against such consequences.

When is a Specialist a Specialist?—*Journal of the American Medical Association*, vol. xxxix, No. 2, page 103, July 12, 1902.

In the malpractice suit of Baker *vs.* Hancock, the Appellate Court of Indiana has defined what is understood as a specialist. The court holds that the skill required by a specialist is greater than that which must be possessed by a general practitioner. It says that a physician is such whenever he acquires sufficient learning to be trusted with a license to practice medicine and it is legally practiced. As to when a physician becomes a specialist, the court holds that is a question of fact. The party may, or may not, have qualified himself as a specialist. Whether he had done so was a matter within

his own knowledge, and primarily for his own determination. Having arrived at the conclusion that he possessed such qualification, it still remained with him whether he would hold himself out and receive and treat patients on the basis of it. When he determines to do this, and does it, it then becomes his duty to exercise that degree of skill which he represented himself as possessing. To relieve one practicing medicine under such circumstances of responsibility commensurate with the pretension by which patients are secured and compensation fixed, would be to give ignorant practitioners license to defraud and to place innocent patients at their mercy.

Evidence of Testamentary Incapacity.—*Boston Medical and Surgical Journal*, vol. cxlvii, No. 1, p. 28, July 3, 1902.

Mrs. Elizabeth Sodens often stated that she would make no will, as she wished her only son, a cripple, to have her property. Two years before her death she began to exhibit signs of paresis accompanied by aphasia, shown by her inability to form sentences, or express ideas. She suffered from delusions, but at times appeared to be rational. A year before her death, while on a visit to her niece, she made a will in conflict with her previously expressed intention. About a month before its execution she told a friend that a will was foolishness, saying she was glad she had none to make and that everything belonged to her son. Surrogate Hoysradt of Dutchess county, N. Y., refused to admit the will to probate, holding that the evidence showed that she lacked testamentary capacity. In the course of his opinion he said: "The expression of Mrs. Sodens of her desire to have her property go to her son should be accepted as a natural design of a rational mind. The intervention of a brain disorder followed by the execution of the instrument offered as her will, and the subsequent statement that she had made no will and that the property belonged to her son, accompanied by an attack of violent insanity progressing until her death, combine to preclude in my judgment the presence of testamentary capacity where no explanation of the inconsistency is given."

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ORIGINAL ARTICLES.

A CASE OF ENDOTHELIOMA OF THE ORBIT.[1]

BY C. A. VEASEY, A M., M.D., PHILADELPHIA,

Demonstrator of Diseases of the Eye, Jefferson Medical College; Assistant Ophthalmic Surgeon, Jefferson Medical College Hospital; Ophthalmic Surgeon, Methodist Episcopal Hospital; Consulting Ophthalmologist, Philadelphia Lying-in Charity.

The following case of orbital growth presented himself at the Jefferson Medical College Hospital on July 8, 1901, for examination and treatment:

History.—H. R. P——, married, a male, aged 35 years, is a chemist by occupation. According to the patient's statement his mother died from "cancer of the tongue." His father had an enlargement on the cheek bone, but as it caused him no annoyance nothing was ever done for it. One brother died of pulmonary tuberculosis. The patient himself is tall and slender, his general health being good. Twelve years before the examination a small growth about the size of a green pea was observed beneath the left upper eyelid at the external portion of the orbit, and in front of the location of the lacrimal gland. The size of this growth slowly increased until it became as large as a walnut. At this time he consulted some oculist at a hospital dispensary, where the condition was diagnosed as a prolapsed lacrimal gland.

Examination showed a kidney-shaped growth, situated beneath the outer third of the left orbital ridge, which was mobile from side to side, but apparently having deep attachments in the orbital cavity. The eyeball was pushed slightly toward the nose and downward, and there was some impairment of the upward movement. No ophthalmoscopic change was found, and the vision of each eye was normal. During the year preceding this examination the growth of the tumor had been much more rapid than before.

[1] Read at the thirty-eighth annual meeting of the American Ophthalmological Society at New London, Conn., July 16, 1902.

Operation.—Extirpation was advised, and as the patient refused to have employed any general or local anesthetic, the tumor was dissected out without their use through an incision along the orbital ridge in the outer third of the lid. Very little difficulty was experienced in its removal except that the point of attachment was deep in the orbital cavity, from which it had to be divided with scissors. There has been no recurrence of the growth.

The specimen was sent to the pathological laboratory of the Jefferson Medical College, and under the direction of Prof. W. M. L. Coplin sections were made and a report submitted.

Macroscopical examination showed the growth to be kidney-shaped, measuring 2½ centimeters in length, and from 1 to 1½ centimeters in width. It was hardened in a three-per-cent solution of formalin, and was firm in consistency, cutting with little resistance. The outer surface is smooth and of a slate color, with grayish mottling. The inside surfaces present a granular appear-

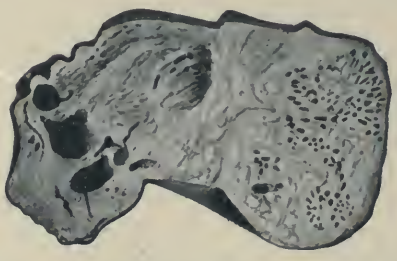

PLATE I.—Endothelioma of the orbit. Macroscopical appearance of incised surface. The growth was half the size of the reproduction.

ance, one-half of these surfaces being dark-gray with blackish, yellowish, and brownish mottling, while the remainder is light-gray in color. If pressure is brought to bear upon the latter half a grayish gelatinous material exudes, giving to the surface a honeycomb appearance. In the dark-gray half of the inside surfaces are three black areas containing gelatinous material, each measuring approximately two millimeters in diameter, two of these areas being partially surrounded with a narrow rim of grayish, translucent, jelly-like substance. The mass is completely encapsulated. After dehydrating in alcohol and embedding in paraffin the sections were stained with hematoxylin and eosin, picric acid, toluidin blue, by Van Giesen's method and for hyalin material.

Microscopical Examination.—Sections made from the light-gray half of the mass are covered on three sides by a layer of fibrous and muscle tissue, the width of the layer varying from one to two millimeters in thickness. It contains areas of rhexis, and scattered

through it is a small amount of blood pigment. It also contains a few small round connective tissue cells and a number of large cells that take eosin intensely, but do not take any basic stain. At one end of the growth there is an area of gland structure in the fibrous layer, but between this and the tumor proper the capsule is found unbroken. The gland structure presents the ordinary appearance of normal lacrimal gland.

Within the capsule the structure is composed of fibrous and muscle tissue and finely reticulated network that stains faintly with the basic dyes. In this structure are what appear to be giant cells,

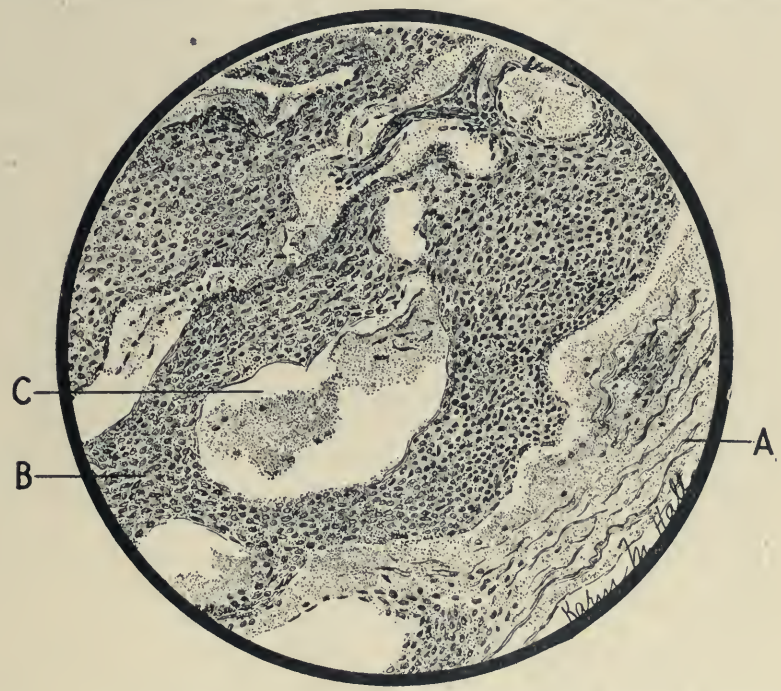

PLATE 2. — Endothelioma of the orbit. Microscopical appearance showing at A, extreme margin of capsule; B, columns of endothel al cells; C, distended lymph spaces containing more or less granular acidophilic material. (Technique: Fixed in formalin, paraffin, hematoxylin and Van Giesen. Obj., B. and L., ⅙ in., oc. 1 in.)

with a low magnification, but with a high magnification it is found that they consist of a number of cells lying very close together. Their nuclei stain intensely with the basic dyes, while the protoplasm stains with the acid dyes. In a number of the cell clusters there is a faintly basophilic intercellular substance; here the nuclei do not stain so intensely, and the protoplasm is granular and basophilic in character. Throughout the reticulated structure there is also found another type of cell, varying in size from 7 to 20 micro-

millimeters in diameter, some being oval and others polyhedral in shape. Some of these cells do not take any basic stain, while others take it only faintly. Many anastomosing spindle and stellate cells are also found.

In the dark-gray portions of the growth the cellular elements are more conspicuous. In many of the cells the nuclei are oblong, resembling the nuclei of muscle fibers, and varying from 8 to 15 micromillimeters in size, and staining intensely with the basic dyes. Some of them are surrounded by a rim of protoplasm, but the greater number appear to lie free in a basophilic granular material. In other situations the nuclei are either oval or spindle-shaped, but are all surrounded by a rim of protoplasm. Many of these nuclei contain vacuoles. Beside these, or near-by, are many spaces that are found to be occupied by a finely granular basophilic material, and are surrounded by a rim of basophilic material somewhat denser than that just referred to. There are also a few scattered areas of hyaline cartilage undergoing myxomatous degeneration.

Throughout the entire sections, but more marked in the periphery, are large areas that are composed of homogeneous acidophilic substance, and within these areas are grouped the cellular masses and mantle-like accumulations of endothelial cells. The microscopical examination, therefore, shows the growth to be a mixed tumor of endothelial origin similar to the mixed tumors of the parotid, to which the term endothelioma has been given; and the general grouping and arrangement of the cells is such as to justify the term used by Borrmann of lymphangio-endothelioma.

Warthin[1] has reported a somewhat similar case having its origin in the lacrimal gland. The patient was a farmer, aged 45 years, whose family and personal history were negative. Five years before the growth was removed by Dr. Fleming Carrow there had been observed a bulging of the right eye, which increased gradually until there was marked exophthalmus. For two years preceding the removal of the growth the increase in size had been very slow. Vision in the right eye was 14–120; in the left 14–20. The eye of the affected side showed neuroretinitis and interstitial choroiditis. The tumor was about the size of a walnut, and was found well back in the orbit in the lacrimal gland region, but its exact relations to the gland could not be definitely determined. The tumor was shelled out of its bed, having no attachments, after which the exophthalmus disappeared, and the vision improved.

[1] Aldred Scott Warthin: "A Case of Endothelioma of the Lachrymal Gland (Myxo-Chondro-Endothelioma Cylindromatodes), with an Analysis of Previously Reported Cases of Lachrymal Gland Tumors." *Archives of Ophthalmology*, vol. xxx, 1901, p. 601.

The growth was found to possess a thick capsule of dense hyaline connective tissue, from which trabeculæ of a similar tissue passed into the growth, giving it somewhat of a lobulated appearance. Between these trabeculæ the appearance of the cut surface varied greatly, in areas being firm and quite like cartilage, in other portions translucent and jelly-like; other areas were yellowish, granular, and of a crumbling consistency. There were a few small reddish spots scattered over the surface. Immediately beneath the capsule the peripheral portion was pinkish, more homogeneous, and of softer consistency.

The microscopical examination showed the growth to be a mixed tumor, containing myxomatous tissue, cartilage, cylindromatous and sarcomatous areas, similar to the mixed tumors of the parotid. Just beneath the peripheral cellular zone there were scattered gland spaces lined with short columnar or cubical epithelium similar to that of the lacrimal gland. Many of these glands were very irregularly branched, some were cystic, and nearly all contained a colloid substance. A few of these glands were found also in the peripheral zone, but they were most numerous toward the center, where some areas presented the appearance of normal lacrimal gland structure. It is believed, therefore, that this growth had its origin from the lacrimal gland.

The author in his most excellent monograph reviews the literature of lacrimal gland tumors, and states his belief that the great majority of lacrimal neoplasms are mixed growths of endothelial origin similar to his own case, and should therefore be classed as endotheliomata, to accord with the similar tumors of the parotid. It is also stated there can be but little doubt that in all of those reported cases of lacrimal gland tumors in which cartilage, hyaline and myxomatous tissue were present in the growth, the neoplasm was similar or identical with the mixed tumors of the parotid.

In my own case the connection with the lacrimal gland is not so apparent, for while the growth seemed to be so adherent to the gland that a small portion of the latter was excised in its removal, serial sections show that the capsule between the gland and the growth was unbroken. In addition, no gland spaces with epithelial lining are present.

As pointed out by Warthin, the serous gland endotheliomata occur most frequently in early adult life, giving rise to slow-growing painless tumors, which are usually found encapsulated. There seems to be very little tendency to become malignant, and when they have been entirely removed their recurrence is seldom observed.

HEMORRHAGE IN TYPHOID FEVER.[1]

BY ROLAND G. CURTIN, M.D., PHILADELPHIA.

With the exception of failure of the heart and perforation, there is no complication of typhoid fever that so suddenly presents itself as hemorrhage—often when the case seems to be pursuing a satisfactory course. It is essential that we should be constantly on the lookout for symptoms indicating either frank or concealed hemorrhage; and that, when these are once discovered, prompt treatment should be instituted. Delays at this critical period are dangerous.

Etiology.—The exact etiology of this unfortunate complication is hard to explain. Why some cases should have hemorrhages, and others, much more severe in every way, should not, may perhaps be best explained by taking into consideration the profound changes which take place in the blood of typhoid patients. The partial or total disappearance of fibrin must interfere with the coagulability of the blood, and therefore increase the tendency to hemorrhage.

In different epidemics the percentage of hemorrhagic cases in adults varies from 3½ to 8. In taking statistics from the different hospitals, it has been found that in some years hemorrhage is exceedingly rare, while in others it is quite a common complication. This is explained by the fact that in some epidemics the sloughing in the bowels is greater than in others, and that the blood-changes vary with the severity of the toxemia.

I have never seen a case of hemorrhage from the bowels in a child under six years. Statistics have been compiled, and it has been found that in children under 15 the hemorrhage occurs in only from 3 to 4½ per cent. It is very much more common between 10 and 15 years than between 5 and 10. It is curious that such should be the case, because the tissues of a young child are so much softer and more delicate than those of an adult, and the circulation is so much more active; but, again, we must remember that the delicate bowel of a child is not so deeply eroded in typhoid fever as is that of an adult, and the sloughing does not seem to be so great. This, perhaps, accounts for the rarity of hemorrhage in young children.

In 232 cases under 15 years of age observed by Taupin, Rillet, and Berthez, this complication occurred but once. Morse has collected some statistics, showing the percentages in children of hemorrhagic cases. In 77 children under 10 years there was no

[1] Read Sept. 24, 1902, before the Philadelphia County Medical Society.

hemorrhagic case; in 204 between 10 and 15 years there were nine instances, but without a death. Therefore, the mortality in young children seems to be low.

The following paragraph is quoted from Hand and Walker's series of seventy-one cases of typhoid in children under twelve years, treated in the Children's Hospital, Philadelphia, during 1901: "Intestinal hemorrhage occurred in four cases, the amount of blood in the stools of three being very slight and scarcely enough to be called a complication. In one case there were three passages, each containing considerable blood, but without any shock or interruption to the favorable course of the case. The deaths numbered three, a mortality of 4.2 per cent. One case died of noma, one of diphtheria, and one of toxemia; the mortality, therefore, of uncomplicated typhoid fever in this series was less than one per cent.

There are, I believe, rare instances in which it is reasonable to suppose that conditions other than anatomical ones exert some influence upon the escape of blood from the blood-vessels. In this connection I will report a case in which the hemorrhages were stopped by a mental impression: A child of about 12 years, a patient of Dr. Ogden, was suffering from typhoid fever with profuse hemorrhages from the lungs, stomach, fauces, nose, mouth, bladder, and bowels. If the hemorrhages had continued, the amount of blood lost would have been sufficient to kill the patient in a few hours. We gave an unfavorable prognosis to the child's mother; and, with tears in her eyes, she went into the room in which her daughter was lying. In a whisper, the child said: "Did the doctor say that I am going to die? Don't cry, mother, and I will get well." In a short time the blood began to flow less freely, and in about eight hours it had entirely ceased.

To show how other hemorrhages than those of typhoid fever may be arrested by emotion, I will cite the following: A woman with chronic phthisis was seized one morning with a profuse hemorrhage from the lungs. In the latter part of the afternoon she was taken up-stairs to her room, and a fire kindled in a stove in which her son had previously concealed a quantity of gunpowder. An explosion ensued, destroying the stove. The greatest solicitude was after this felt for the patient; but it was found that the bleeding had been summarily arrested by the shock of the explosion.

I will also read the report of a case in which emotion caused a hemorrhage from lungs in which there was no ulceration: A woman having a small phthisical area at the right apex—as shown by bronchial breathing, impaired resonance, progressive emaciation, and

slight cough — was shocked one day by seeing an undertaker's wagon draw up in front of her house. Supposing that the wagon contained the body of her husband, she was immediately seized with a profuse hemorrhage, and died in a few minutes. The corpse that had occasioned her alarm had, by mistake, been driven up in front of the wrong door, being the body of a man who had resided in the next house. At the autopsy on the body of the woman, it was found that the lungs were merely indurated, and that the breaking-down process had not commenced.

These cases serve to show that mental shocks may favorably or unfavorably influence persons who have anatomical lesions from which hemorrhages are liable to take place.

Pathology.—The erosion of a blood-vessel in the intestinal canal is caused by the process of ulceration that is going on inside the bowel, and the blood-vessels may be so eroded or weakened as to allow of rupture; hence the outpour of blood. The hemorrhage usually takes place after the end of the second week, at which time the sloughing process begins. It may, however, occur later, and in some rare instances earlier. When the bleeding is from the hemorrhagic diathesis, this fact may account for some of the very early hemorrhages. In some instances it is difficult to mark the commencement of the initial stage of the disease; hence, although the patient may be considered to be in only the first or second week of the attack, he may really be in the second or third.

As a general thing, the blood is not passed when it leaks out of the blood-vessel, but is retained—for a short time when the bowels are loose, and for a longer period if the patient is constipated. The bleeding may be over when the blood is discovered. The period that elapses between the time of the hemorrhage and that of its expulsion from the bowel makes a great difference in the appearance of the blood. When it is expelled promptly, it may be arterial in color. When it is retained but a short time, it becomes clotted and bluish, though red in places on the surface, the latter color being due to the blood having become aerated through standing in the open vessel. When the blood is retained for a long period in contact with the intestinal juices, it becomes dark and tarry in appearance and consistency.

There is one class of cases of which I have seen but four instances; this is the petechial form of typhoid fever. In this form we have ecchymotic spots over the whole body and extremities, hematuria, epistaxis, hematemesis, hemoptysis — in fact, we may have hemorrhage from all the mucous surfaces. In one such case I

have seen bleeding from the eyes and ears. Two out of the four cases recovered.

Diagnosis. — The first requisite is to have on guard some one competent to advise the physician as to the advent of the complication. I once had a nurse who, when I entered the sick-room, pointed with pride to the subnormal temperature and remarked that the patient was doing unusually well, when, in fact, he was suffering from the effects of a concealed hemorrhage.

The statistics that I have collected show that when the hemorrhage is slight, it has little or no influence upon the temperature or upon the strength of the patient; hence we are called upon to diagnosticate such cases by the observation of other points than the general symptoms. When the blood is retained in the intestinal canal, the patient—as in one of my cases—may die without the external escape of a single drop of blood, but with all the evidences of an internal hemorrhage. The symptoms in the case mentioned were those of collapse—a rapidly failing pulse, relaxation of the skin, a cyanosed surface, an anxious expression of the face, and a gasping for breath—the abdomen at the same time being distended and perfectly flat on percussion.

Many mild cases were omitted from this report, on account of a doubt as to whether they were hemorrhoidal or were instances of typhoid hemorrhage from ulcerated glands in the intestines. In one instance a case was diagnosed by the resident physician as one of hemorrhage from the bowels, and was put upon a treatment appropriate to such an accident; upon careful examination, however, it was discovered to be a case in which the menses had been hastened by the bowel irritation. This case illustrates the liability to error in diagnosing mild cases of enteric fever with hemorrhage, from hemorrhoidal bleeding or from menstrual flow.

There is one point to which I should like to call your attention. Very often, after a fall in the temperature and a subsequent rise, the bowels are moved and a considerable quantity of pure blood is passed; but the treatment then instituted is frequently such as to check the action of the bowels. The next time the patient has a passage—perhaps twelve or twenty-four hours later—there is evacuated some dark or tarry blood. This is generally looked upon as indicating a second hemorrhage, while in reality the general symptoms and the temperature go to show that the blood was all poured into the bowel at the same time—the second evacuation consisting of the portion that was retained in the bowel owing to the treatment having stopped the bowel action after the first portion was passed.

When the hemorrhage ceases, the temperature usually rises again nearly to the point at which it was before the bleeding took place; in some cases even higher, owing to the reaction from the excessive loss of blood. The amount of blood lost can generally be easily estimated by the fall in the temperature, the exsanguined appearance of the patient, and the prostration produced.

Prognosis.—During the last twenty-five years I have carefully tabulated all the cases of marked hemorrhage from the bowel in typhoid fever that I have seen in my own practice and in consultation, most of those occurring in the Presbyterian and Philadelphia Hospitals, and some that occurred in St. Timothy's. In the 100 cases tabulated, 80 have been taken from hospitals; the remaining 20, from private practice. In those taken from the hospitals the mortality is much greater than it naturally should be, owing to the fact that many cases first treated outside are sent to a hospital on account of the dangerous condition of the patient, and are sometimes admitted in a moribund state. Some of these cases were brought to my notice through their having proved fatal. The hospitals from which I have gathered the statistics receive mostly adults; hence my statistics include but few cases in childhood.

From the experience that I have had with this class of cases, I am satisfied that those with the most severe symptoms sometimes recover. This is well shown by the case of the little girl already referred to. This child had typhoid fever and general hemorrhages; but when it was supposed that death was quite near, she speedily recovered. Another instance of the same kind is afforded by a case that I saw with Dr. J. Howard Evans. A boy of about eight years had had, for about twenty-four hours, hemorrhages from the bowels in which an almost continuous stream of dark, clotted blood was passed. He was almost pulseless, quite exsanguined, and in a state of collapse; but under treatment his recovery was quite rapid. In one case seen in the University Hospital in 1876, a man was apparently bleeding to death; but an injection of ergotin seemed at once to stanch the flow. He then slowly returned to health; yet no one who saw the case had any idea that he could recover.

The associated conditions that seem to be the most serious in severe cases of hemorrhage are the following:

1. Renal disease, which sometimes alters the blood, in some cases rendering it less coagulable, and thus favoring hemorrhage from all points.

2. Marked organic heart disease, in which the blood, being

impoverished and lessened in quantity, is propelled slowly, causing the tissues to be only imperfectly supplied with blood. Under these circumstances a hemorrhage from the bowel becomes a most grave complication.

3. Hemophilia, in which the blood becomes so altered that there is little likelihood of the hemorrhage being stanched, and much liability to other hemorrhages.

4. A tympanitic distention of the abdomen with the continual discharge of black, clotted blood, which is a very serious condition, as the blood-vessels are kept patulous by the distention of the intestines; or the latter and the blood-vessels have both lost their contractile power, thus favoring relaxation, not only of the bowel, but also of the mucous membrane of the blood-vessels. I always dislike to see this condition in hemorrhage from the bowels.

5. Obstinate diarrhea and vomiting, which are decidedly unfavorable to the stanching of the blood.

Treatment.—I have found the usual remedies for hemorrhage from the bowels to be of more or less value. If the hemorrhage is caused by a leakage from the mucous membrane, ergot, both hypodermically and by the mouth, is efficacious.

I have great faith in turpentine, externally and internally. In cases in which the hemorrhage is associated with tympanites it is especially good. In applying it externally, I prefer to have it sprinkled upon a piece of flannel. This is, I think, better than the stupe, which, by producing warmth, favors bleeding.

Opium is of great importance when the bowels are inclined to be loose.

In cases in which the stomach will bear it, oil of erigeron, given in a capsule, does have a seemingly good influence. The vegetable and mineral astringents may do good in the same class of cases, but they also are liable to disorder the stomach and take away the appetite, especially after the hemorrhage has been stopped.

Ice applied to the abdomen externally, or pieces of rounded ice slipped into the bowel, seem to have some efficacy in retarding the flow of blood; but it is essential that the impression made upon the blood-vessels be continuous, and not intermittent. In applying the ice externally, an ice-water bag, or some other receptacle that will keep the patient from becoming wet, should be employed.

During the last two years I have seen the advantage to be derived from the use of suprarenal extract in cases in which there is general hemorrhage. A colored man in the Presbyterian Hospital had marked epistaxis, a persistent flow of blood from the bowels,

and the vomiting of blood; and all remedies seemed to fail, until he was placed upon this remedy. In the course of eight or ten hours the blood began to diminish in quantity, and in twenty-four hours the patient stopped bleeding altogether. He made a good recovery. In some severe cases I have also tried thyroid extract, with apparently good results.

The head of the patient should be kept lower than the feet. This can be accomplished by raising the foot of the bed.

In extreme cases I have seen the efficacy of placing ligatures around the limbs during the hemorrhage. These prevent the blood flowing back from the limbs to the body, favor the stanching of the blood, and at the same time save that fluid for the future use of the patient. They should not be so tight as to prevent the flow of blood in the arteries, but should be tight enough to stop the return of the blood in the veins.

I will here quote from a paper read by me before the American Medical Association in June, 1897, on the statistics of sixty cases—nearly all that I had collected up to that time:

"I published a clinical lecture in the Philadelphia Hospital Reports in 1893, giving statistics of the first 17 cases that I had gathered at that time. Of this series, 5 died and 12 recovered; 7 were treated at their homes, and 10 in the hospital; and of the 5 deaths, but 2 were private cases.

"In the last series of 43 cases, the mortality has increased, 23 having died, while 20 recovered. In 5 private cases, 2 died; and of the hospital cases, 21 died and 17 recovered, making the mortality over one-half. What is the cause of this increased mortality?

"These later cases have been collected since the introduction of the cold-water treatment, which is used quite generally in the hospitals from which the cases were taken. In the private cases, cold sponging was resorted to in every instance reported in the last series.

"Upon investigation, I found that since the cold-water treatment has been introduced the number of hemorrhagic cases has considerably increased, according to the hospital records that furnished the data; and, in addition, that the mortality of the hemorrhagic cases has largely increased, viz., from 5 to 17, or less than one-third, to 25 in 43, or over one-half. . . .

"Let us see what is the effect following the free use of cold to the surface, which is so universal in the hospitals. When you take into consideration that the application of cold drives the blood from

the surface of the body, you will realize that an increased amount of blood will collect in the interior, causing a congested condition of the internal organs. If there happens to be a blood-vessel weakened or opened by the suppurative process, it may give way; or a clot may be dislodged and a hemorrhage follow. The disturbance necessary in giving a cold bath or the reaction following such a bath may have a tendency to produce the same result. On inquiry I find that in two of the tabulated cases the hemorrhage seemingly took place while the patient was in a bath, and in one case immediately after the bath. One hemorrhage occurred while the patient was in a cold pack, and two just after a cold sponge.

"These statistics seem to indicate that it would be well to avoid cold applications to the skin when there is a tendency to hemorrhage, or when this has already occurred. I would also suggest that during the third week, when the sloughing process is the most active, the cold bath or pack, if used at all, be employed with great care, avoiding sudden and marked impressions upon the external circulation. In this way we may avoid making the case a hemorrhagic one."

My series of tabulated cases has reached nearly one hundred. In the near future I hope to be able to present some facts in regard to them that may be of value in the management of this interesting complication of a too prevalent disease.

Dr. Curtin said that he had nothing to add in closing the discussion, except to refer to three cases in the Presbyterian Hospital that presented all the unusual symptoms of perforation — collapse and localized peritonitis. In two of these cases no perforation was found, simply the circumscribed peritonitis.

THE SIGNIFICANCE OF ABDOMINAL PAIN IN TYPHOID FEVER.*

BY HERMAN B. ALLYN, M.D.,
Instructor in Physical Diagnosis in the University of Pennsylvania; Clinical Professor of Medicine, Woman's Medical College; Physician to the Philadelphia Hospital.

In a large number of cases—two-fifths of the patients, according to McCrae[1]—typhoid fever runs its course without abdominal pain or tenderness. We should err, therefore, if we looked upon pain as a symptom so constant as not to need special attention. The causes of the pain met with in typhoid fever may for convenience be divided into extra-abdominal and abdominal. To the former division belong the cases of hysteria and general hyperesthesia, in which there is often great complaint of pain and tenderness. They are usually easily recognized. Here belong also cases of pleurisy, empyema, and pneumonia, with marked abdominal pain. They are very interesting, but there is only time to mention them now.

Of the abdominal causes, some, such as distended bladder, menstruation, abortion, and labor, have nothing to do with the specific fever, and need only be kept in mind to be recognized in a concrete example at the bedside. The remaining causes are the most important. They are intestinal colic and distention of the bowel with gas; enterocolitis; deep ulceration, so that the serosa is involved; phlebitis of an abdominal vein; coincident appendicitis; ileus; peritonitis without rupture; cholecystitis and liver abscess; hemorrhage and perforation.

Colic and Distention.—Pain from simple colic and distention can be recognized by the presence in the stomach or bowel of gas, the escape of which relieves the pain; by the history showing the ingestion of improper food; or by the passage of curds or other undigested food in the stools. The pain is usually general over the abdomen, or moves from place to place; it is not accompanied with tenderness, but is relieved by pressure. It has little effect on pulse and temperature. Vomiting is not common in simple colic, the attack usually lasts only a few hours, and the pain is not so severe as to make the patient cry out. The aspect of the patient does not suggest great suffering. The bowels are often constipated, and the abdomen distended with gas. A free movement of the bowels or the escape of gas through a rectal tube may end the attack.

Enterocolitis.—In enterocolitis pain is usually accompanied with some soreness, but both are of a dull character and are diffused, not

*Read at the meeting of the Philadelphia County Medical Society, Sept. 24, 1902.

localized as in perforation, cholecystitis, or appendicitis. The stools are frequent, loose, and often contain undigested food, shreds of mucus, and even flecks of blood. The abdomen may be distended or flaccid. Pulse and temperature are not much affected. These are just the cases, however, in which at any time either hemorrhage or perforation may occur.

Deep Ulceration.—Intestinal ulceration is not necessarily attended with pain. We have all seen cases at autopsy in which the bowel showed extensive ulceration, and have been surprised that no pain was complained of by the patient. This has been my experience both in typhoid fever and in amebic dysentery. But in general when the ulcers are numerous, and especially if they be deep, pain is likely to be present, and tenderness on pressure still more to be expected. If the ulceration is deep enough to involve the serosa, the pain may be sharp and severe enough to simulate the pain of perforation; otherwise the pain is dull.

In a case operated on under cocaine by Mitchell, and reported by McCrae, great pain was complained of when the serosa over the base of an inflamed Peyer's patch was touched. This did not, however, occur in other cases. Appendicitis was also present.

It is certain that pain, tenderness, tympany, and diarrhea bear no constant relation to the extent of ulceration.

Phlebitis of the Iliac Veins.—This can only be diagnosed when abdominal pain follows phlebitis of the leg. I have seen such a case. Possibly, as in Case 26 reported by McCrae and Mitchell,[2] there may be tenderness along the iliac veins.

Appendicitis. — Appendicitis may occur as a complication of typhoid fever and be responsible for the pain. McCrae and Mitchell report a case which was operated on and ended in recovery. There was no evidence that the appendicitis was due to a typhoid process. The only organisms obtained from the appendix were the bacillus subtilis and saprophytes. Fitz found that perforation was in the appendix in three per cent of 167 cases; and one of Gairdner's 47 cases had a perforation in the appendix. Perforation of the appendix alone occurred in three of the 112 operative cases collected by Finney.[3] In the Johns Hopkins Hospital 20 cases (pathological records), perforations of the appendix were found in two cases; and Cushing[4] says he knows of one more in a group of nine, which makes perforation of the appendix occur in 9.6 per cent of the cases showing perforation.

Possibly the inflamed appendix could be felt by a finger introduced into the rectum. Otherwise I can see no way in which an

appendicitis occurring in typhoid fever could be differentiated from the peritonitis of perforation.

Ileus.—Obstruction of the bowels occasionally occurs in typhoid fever. Curschmann refers to cases; Cushing has met with it in an operative case, and refers to cases of Harrison and Barte. The symptoms are mistaken for those of perforation, but leucocytosis appears to be much greater.

Septic Peritonitis Without Perforation.—This may occur when there are necrosed and damaged areas of peritoneum over the bases of ulcers. Such cases have been reported by Gairdner, and by Shattuck, Warren, and Cobb.[5] It may be that in rare cases bacteria pass through the bowel when there is an ulcer down to the serosa, and thus excite peritonitis. The authors just quoted report two cases in which a beginning general peritonitis, as evidenced by gas and serous fluid in the abdominal cavity, was found at operation, but the peritoneal coat was not injected. They also report a case of peritonitis due to necrosis and rupture of a mesenteric gland. In such cases there would be the pain and other symptoms due to peritonitis, but the cause could not be discovered except at operation or autopsy.

Cholecystitis and Abscess.—Cholecystitis is fairly common in typhoid fever, and a few cases of liver abscess have been reported. Cases and literature will be found in the papers of Osler,[6] Mason,[7] DaCosta,[8] the monographs of Keen[9] and Hare,[10] and the article of Camac.[11] The onset of cholecystitis is marked by pain in the upper right quadrant of the abdomen, tenderness on pressure beneath the right costal border on a line between the tenth rib and the umbilicus, and some muscular rigidity. In the three cases I have seen the attack occurred in convalescence.

Case 1.—Mild typhoid fever with cholecystitis; recovery without operation. A young woman had a mild but undoubted typhoid, lasting about three weeks. After the temperature first fell to normal it was often a fifth of a degree above normal without obvious cause. On November 5, 1901, the temperature was 99.4°. She had a feeling of fulness and tension around the abdomen on a level with the stomach, but did not mention it until later. After midnight she developed severe pain in the epigastrium, perhaps a little more marked to the right, and in the right axilla and back. The pain increased in severity in spite of emptying the stomach and external applications. Morphine was required twice, at 3 and 4.30 A.M. There was some nausea; no tympany, abdominal tenderness, shock, or diminution of liver flatness. The temperature rose to

102°+, the leucocytes from 4000 to 19,000. When seen November 6 she looked ill, with frequent, small, rather hard pulse, 120 per minute. There were dark circles under the eyes. No tympany or abdominal tenderness. Nothing was discovered by rectal examination except slight tenderness on pressure a little to the right of the os uteri. There was no mass and no fixation of the uterus. Some hardened feces were felt in the rectum and descending colon. The conjunctivæ were slightly yellow. The bowels were freely opened with salines. At 9 P.M. the temperature had fallen slightly, and the leucocyte count was 11,000. The heart, pleura, and lungs were normal. The patient slept well. The next morning, November 7, the temperature was 99°. Then, for the first time, a movable, rather hard tumor, the size of a duck egg, was felt just above the umbilicus; it descended on full inspiration, was dull on deep percussion, but liver flatness was not continuous with it. The eyeballs were slightly more yellow. There was no vomiting, but slight nausea. The temperature ranged between 99° and 100° for a few days, and then fell to normal. There was no recurrence of pain. Tenderness was not pronounced, and gradually subsided. On some days the gall-bladder could be distinctly felt, and its connection with the liver made out; on others it could not be felt.

Case 2.—Relapse in typhoid with cholecystitis. E. S——, male, aged 45, when ten days convalescent from typhoid fever ate heartily of a Christmas dinner. Two hours later he was seized with severe pain beneath the right scapula, and began vomiting. That night he had a severe chill, so that he shook the bed. The next morning the temperature was 104.4°, the pulse 93. The pain was now over the upper zone of the abdomen, though the region of the appendix was tender on deep pressure. The abdomen was rigid, especially on the right side. By the following morning the bowels had moved twice. The temperature was 101.6°, pulse 94. There had been no vomiting or chill. There was a tender mass in the abdomen beneath the liver and above the transverse umbilical line. For several days following the temperature rose in the evening to 104° or 105°, and he had chills and vomiting. The blood twice yielded the Widal reaction. The mass in the abdomen was irregular, hard, nodular, and tender to pressure. It remained nearly stationary in size for two weeks. He recovered without operation.

Case 3.—Cholecystitis in convalescence from typhoid fever. M. C——, female, white, 33 years old, was admitted to the Philadelphia Hospital August 15, 1901. There was a history of five weeks illness before admission, characterized by chills, fever, sweats, diar-

rhea, and vomiting. She is believed to have been ill with typhoid fever about five days when admitted, as the first Widal was negative. The Widal reaction was positive first on August 19. The patient reacted badly to tub baths. On August 25 she had collapse, followed by the appearance of blood in the stools.

Her convalescence was interrupted by several recrudescences. On September 17 the leucocytes were 5000. She had dull, aching, epigastric pain during the night of the 17th and early morning of the 18th, and vomited. On the 18th she was seized with severe pain in the precordia and right hypochondrium. The pain was griping and darting, causing acute agony. Ice-bags locally and morphine internally relieved the pain. She had a chill at 10 A.M., followed by rapid rise of temperature to 105°. The chill lasted ten minutes. No malarial organisms were found. After the chill the leucocytes rose to 15,000. The tongue was dry, the skin a pale brown, the conjunctivæ slightly icteroid. There was tenderness in the epigastrium and right hypochondrium. The liver extended two centimeters below the costal border. The pain did not recur during the day, but the patient vomited at 11 A.M. At 4 P.M. the leucocytes were 7000. She complained of griping, colicky pain in the abdomen about the umbilicus. There was tenderness in the epigastrium. A vaginal and rectal examination was negative. The temperature fell to normal on the 19th, then rose to 101°, and gradually sank again to normal in a week.

McCrae and Mitchell report five cases of cholecystitis. The picture presented by cholecystitis is that of a patient seized with severe pain in the right upper quadrant of the abdomen, the pain often requiring anodynes, and being accompanied with a varying degree of tenderness and muscular rigidity. The temperature rises sharply to 100° to 104°. A moderate leucocytosis is the rule. Vomiting is common, and there may also be chill. Jaundice was present in two of my cases, and in one reported by McCrae and Mitchell. A demonstrable tumor is more frequently absent than present. It was felt only once in McCrae and Mitchell's cases and in two of mine. In two of their cases and in all of mine it occurred in convalescence or in relapse; and this, it seems to me, is a point of value in the diagnosis. Possibly many of the cases showing recrudescence are mild gall-bladder infections. I recall the case of a boy aged 18 years who had typhoid fever twenty-eight days before the temperature became normal. The following day it began to rise, until at 6 P.M. it was 104°. He complained of some soreness and pain in the right side of the abdomen below the liver and above

the region of the appendix. A small lump about the size of a hickory-nut could be felt; it was tender to pressure; it did not move with respiration. Subsequently he had a chill and nausea, which increased, and he vomited undigested milk. After a few days the tenderness became localized to the region of the appendix, which was slightly enlarged.

We are accustomed to ascribe these attacks in convalescence to undigested food. But it seems to me unreasonable to think that so sharp a febrile reaction is due to nothing more serious. The greatest difficulty I have had is in deciding between cholecystitis and appendicitis.

When the gall-bladder ruptures, the symptoms are those of perforative peritonitis, several instances of which have been reported. The writer has elsewhere published a case in which there was perforation of the gall-bladder and colon.[1 2] A few cases of liver abscess have been recorded. Most of the cases have been recognized only at autopsy.

Intestinal Hemorrhage.—Intestinal hemorrhage is a cause of pain, but as it has been fully treated to-night by Dr. Curtin it is only mentioned here to make the list of causes complete.

Perforation of the Bowel.—This is the most serious and important of the painful abdominal complications of typhoid fever. Shattuck, Warren, and Cobb report seventeen cases, and McCrae and Mitchell, in a paper which has appeared while this article was in preparation, report eight cases in a series of 275 occurring in Dr. Osler's service in the past two years. All of these twenty-five cases were operated on. It is painfully evident from a study of them that no symptoms and physical signs invariably indicate perforation. While sudden severe abdominal pain in the lower abdomen, accompanied with tenderness, rigidity, drawing up of the knees, distention, nausea and vomiting, sweating, a fall or an increase in temperature, a more frequent and feebler pulse, movable dulness in the flanks, and leucocytosis, indicate pretty certainly a perforation, such a combination of symptoms is rarely met with, and if it were it would point to an existing peritonitis rather than to the perforation which preceded and caused it.

Premonitory Symptoms.—We need more information as to the premonitory symptoms of perforation, and a keener appreciation of pain as the only constant symptom of the onset of perforation. In my own experience perforation has occurred in severe cases which have been characterized by loose bowels, distention, or hemorrhage. But in eighteen of the twenty-four cases reported by Shattuck,

Warren, and Cobb, the clinical nature and course of the typhoid was mild, and in fifteen of these eighteen mild cases perforation or a general septic peritonitis was present at operation. In some cases varying degrees of abdominal pain and tenderness precede the perforation, and when coupled with distention or blood in the stools should lead to hourly visits to the patient. A leucocytosis may also be found at this time. But a leucocytosis is found in so many cases that not much value can be attached to it by itself. In seven of the twenty-one cases reported by Shattuck, Warren, and Cobb, there were no warning symptoms before perforation; in fourteen there were distinct warning symptoms of abdominal pain and tenderness. In the cases of McCrae and Mitchell, four of the eight cases presented no abdominal features before perforation; three patients had distention, rigidity, and abdominal pain, in two instances accompanied by leucocytosis. In one case there was intestinal hemorrhage one day before perforation.

Onset.—Abdominal pain, tenderness, and muscular rigidity are the only constant symptoms indicating perforation. The other symptoms already mentioned should be regarded as symptoms of the resulting peritonitis. The pain is sudden, sharp, and often severe enough to cause an outcry from the patient. Such pain strongly suggests perforation, whether premonitory symptoms have occurred or not. The probability of perforation is greater if the pain has come on at or soon after a stool or tub bath. The pain is usually in the lower abdomen, and often in the right lower quadrant. Following the pain and tenderness there may be some shock, sweating, or collapse, but these are not constant symptoms, and collapse is more common in hemorrhage. The temperature may fall, and then usually rises again. In the cases of crisis which simulate perforation, the temperature falls to normal and remains down, as in one of my cases. The pulse becomes more frequent and feeble, the abdomen may be distended, level, or retracted, but the liver flatness is diminished or absent. By degrees, if the patient survive long enough, the well known facies of peritonitis appears.

Leucocytosis demands special consideration. As the leucocytes in typhoid fever are normally low, 4000 to 6000, an increase points to a complication, but affords very little clue to the nature of the complication. It may be absent in perforation at the time the blood is counted. Of the cases reported by Shattuck, Warren, and Cobb, in eight a leucocyte count is recorded at a time corresponding to the severe symptoms of peritoneal infection, and in four of these there was no leucocytosis. In the eight cases reported by McCrae and

Mitchell, in three there was practically no change in the leucocytes after perforation. In one of these the leucocytes were normal throughout, and in the remaining two there had been leucocytosis previous to the perforation, which did not change appreciably. In five cases the leucocytes rose in varying degrees after perforation. They regard it as significant that the two cases showing the greatest rise in leucocytes after perforation were those in which hemorrhage and perforation coexisted. The leucocytes in these cases were 14,000 and 17,500. In the remaining three cases the highest leucocyte counts were between 8000 and 12,000. Evidently we must not expect to find a leucocytosis in every case of perforation. As Cushing has pointed out, an early increase in the number of leucocytes may be succeeded by a fall, and it depends upon when the count is made what result is obtained. While I should not attach much importance to a single count, nevertheless I believe that frequent counts by a skilful and conscientious man are of considerable value.

We must realize, moreover, that leucocytosis and other more important symptoms of perforation are present in some rare cases in which perforation does not exist, or at least in cases which end in recovery without operation. Here is a case of that kind:

Case 4.—Typhoid fever with hemorrhage and abdominal pain indicating perforation; recovery without operation. M. L——, white, 16 years old, Russian, admitted to the Philadelphia Hospital August 30, 1901, complaining of fever. He is supposed to have been ill about fourteen days before admission. His symptoms previous to admission were headache, chill, vomiting, pain in the stomach, and diarrhea. On admission his temperature was 104.8°, pulse 110, respiration 26. His abdomen was flat, and tender in the right iliac region. There was slight bronchitis. Rose spots were found on the abdomen. The Widal reaction was obtained.

The leucocytes were 6000. He became too chilled by tub baths at 60°, and they were stopped. The bowels continued loose, the stools being greenish and offensive in odor. On September 3 he complained of sharp pain in the abdomen and passed ten ounces of blood. There was no shock or collapse. Food and medicine were discontinued by the mouth. Two days later he had sudden acute abdominal pain referred to the right lower quadrant and to the umbilicus. The pulse was 120, the abdomen slightly tender. The temperature fell gradually to normal by the morning of the 7th, without collapse. There was some rigidity of the right side of the abdomen on the 6th, the abdomen being flat; it was very tender;

the pulse was frequent and wiry; pupils moderately dilated; leucocytes 18,000. On the 7th the leucocytes were 14,000. The patient however was restless, face drawn and anxious, pupils dilated; pulse continued frequent, small, and wiry. The abdomen became more distended; tenderness increased over the right lower quadrant; the percussion note was impaired and more resistant; digital examination of the rectum developed increased resistance on the right side; the patient vomited a greenish-yellow material. The bowels had not moved and no gas passed. The aspect of the patient was bad. He was stuporous; the tongue was dry, glazed, and cracked. He was very restless at night. Nevertheless, in spite of such grave symptoms, the temperature remained down, and the patient gradually improved and finally convalesced.

I advised operation in this case on September 5, after the severe abdominal pain following the hemorrhage of September 3. The surgeon who saw the patient was not satisfied that the symptoms indicated perforation, and declined to operate. I feel confident, however, that more patients presenting such symptoms will be saved by prompt operation than by expectant treatment. At the same time the case shows that one should not be dogmatic, for all signs fail at times. It is the ignorant man, and the one who does not make notes of his cases, who is always sure he is right.

The following case is reported as an instance of typhoid fever with perforation which was obscured by the hebetude and toxemic state of the patient:

Case 5.—Typhoid fever, with marked hebetude and toxemia; sudden collapse nine days after admission; death in five hours. T. M——, white, male, 45 years old, was admitted to the Philadelphia Hospital September 8, 1901, with a history of three weeks' illness characterized by chills every second or third day; vomiting, anorexia, loss of flesh, vertigo, offensive breath. He was a poorly nourished, rather pale, spare man, with hebetude, and some tremor of the muscles about the mouth and of the tongue. The heart sounds were weak, the lungs not diseased. Plasmodia of malaria were looked for repeatedly but not found. Both Widal and diazo were positive. The leucocytes on the 11th were 6648. He showed marked toxemia. The fever was continuous. There was constant twitching of the muscles, hebetude, and delirium. There was also severe nephritis. The temperature ranged from 102° to 104°, and was reduced by spongings instead of tub baths owing to his feeble condition. Subsequently he developed severe congestion of both lungs and incontinence of urine. The abdomen was distended.

On September 17 the patient was found in collapse, of which there had been no warning symptoms. There was no pain to attract attention, no variation in temperature. He was found sweating freely at 5 A.M. The abdomen was rigid and tender and beset with small vesicles. The distention increased, and there was diminution of liver dulness. He died suddenly at 10 A.M., five hours after he was found in collapse. At the autopsy, perforation of a typhoid ulcer was found about a foot from the ileocæcal valve. There were no limiting adhesions. Some free fecal matter was found in the peritoneal cavity.

I am well aware that there are other causes of abdominal pain of which as yet we know almost nothing. I am also painfully conscious that I have not done justice to those causes which have been referred to in this paper. The subject is so important, however, that its introduction and discussion must result in benefit to our patients. I wish to insist that pain and tenderness are not necessary accompaniments of typhoid fever; on the contrary, they may be signs denoting the approach or the actual onset of a cholecystitis or perforation of the bowel. Pain is therefore a danger-signal. It should lead to a more careful study of the case, to more frequent visits, the observations being recorded in writing; and when there is reason to suspect cholecystitis, perforation, or peritonitis, a surgeon should have the opportunity to see the patient early and often. Only in this way can the unfortunate patient with a perforating typhoid ulcer be numbered among the 25 per cent saved by surgical interference.

With regard to cholecystitis, also, I believe that in most cases it is safer to have surgical advice. My own cases have recovered without operation, but the next patient may die of a perforating ulcer which had given no warning symptoms.

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ACETOZONE IN TYPHOID FEVER.

BY W. A. EVANS, M.S., M.D.,

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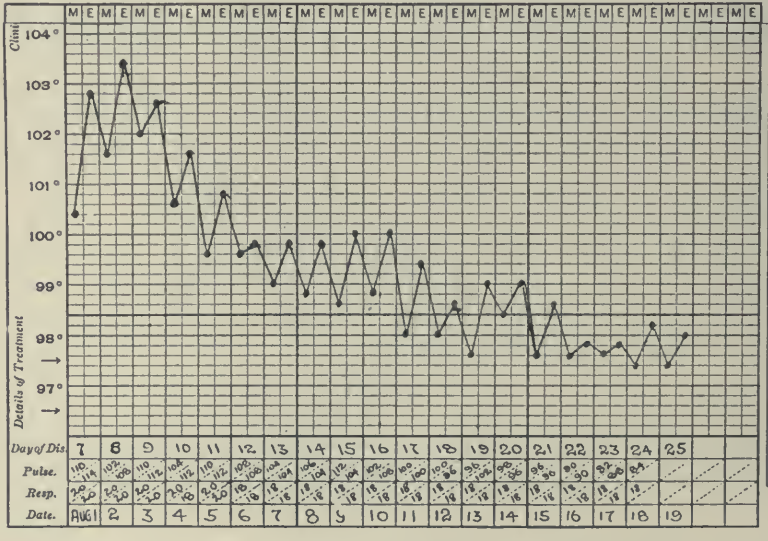
My experience with this drug is confined to a close supervision of two cases of typhoid fever in my own practice treated with it, and a somewhat superficial knowledge of its action in many cases treated with it in the Cook County Hospital.

Case 1.—Mrs. R——, American, married; living at a distance from Chicago. Was referred to me with the following history: On July 26 she complained of feeling ill, with headache, malaise, etc. The next day, July 27, her temperature was 100° F.; July 28 it was 101°; July 29, 101.5°; July 30, 102.5°, when she started for Chicago, which city was reached on July 31, when her afternoon tem-

CHART CASE 1

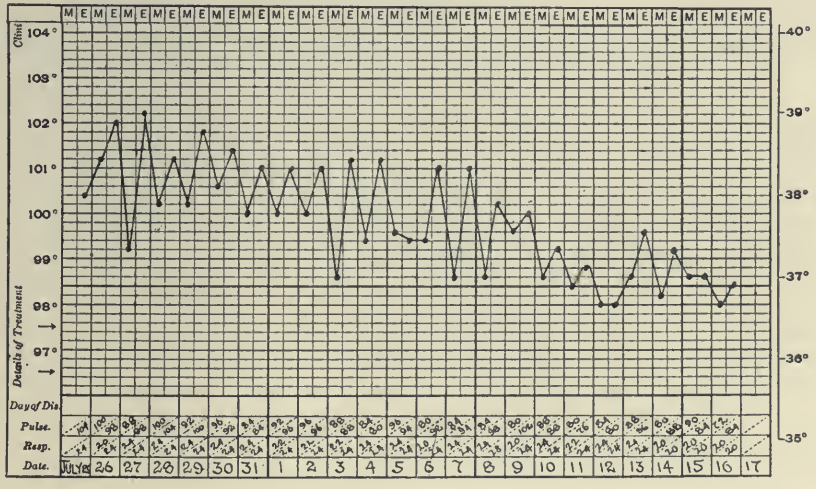


perature was 103.5°. A Widal test was made, which gave a positive reaction. She was admitted to the Marion Sims Hospital on the morning of August 1, the seventh day of her illness. Upon examination her temperature was 100.4°, pulse 110, respirations 20; there were a few rose spots upon the abdomen; the spleen was enlarged, a fingerbreadth below the costal arch; there had been no

epistaxis. The diazo-reaction was positive on August 4. She was placed upon typhoid orders, diet confined to milk, and 120 cubic centimeters of the aqueous solution of acetozone (20 grains to the quart) given every three hours. The course of the illness was uneventful, the temperature returning to normal on August 6, the twelfth day of her illness, and the sixth day of her stay in the hospital. The temperature returned to normal permanently on August 11, the seventeenth day of her illness. She sat up first on August 12, and left the hospital recovered on August 19, the twenty-fifth day after the onset of her illness.

Case 2.—Mr. F——, aged 26; medical student, American, unmarried. Began to feel ill on July 15; complained of headache, malaise, pain in back, etc.; anorexia, some insomnia, night sweats, and stiffness of the neck. There was no nausea or vomiting, and no bron-

CHART CASE 2.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40°
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37°
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35°

chial symptoms. He was constipated, which was relieved by doses of compound cathartic pills, castor oil, etc. On July 25 he was admitted to ward 6 of the Cook County Hospital, with a temperature of 102°, pulse 98, and respirations 24. Widal test was positive on July 26, and on July 29. Leucocyte count on July 28 gave 6400, and on August 6 gave 6200. Diazo-reaction was negative. There were no rose spots, and there was no epistaxis. The spleen was palpable below the costal arch. His diet was confined to milk. Acetozone solution (15 grains of the powder to the quart of boiled water) was given, the patient averaging from four to six ounces every two hours. His stay in the hospital was une-

ventful. His first normal temperature was on August 5, the twenty-first day of his illness. The temperature became permanently normal August 9, the twenty-fifth day of illness, the sixteenth day in hospital. He was discharged recovered on August 17, the twenty-fifth day of his stay in the hospital and the thirty-fifth day of his illness.

Acetozone seems to cause the temperature to return to the normal more quickly than usual, to better the physical and mental condition of the patient, and to decrease the amount of toxemia from intestinal infection.

103 STATE STREET.

IMPORTANCE OF EARLY TREATMENT OF CONVERGENT SQUINT.[1]

BY EUGENE RICHARDS LEWIS, M.D. DUBUQUE, IOWA.

The general practitioner is not infrequently called upon to answer the question, "When is the best time to have crossed eyes straightened?" This question is often asked in a casual way by a father or a mother who has come to consult the family physician upon what seems a much more important matter, perhaps on the question as to whether one of the children has worms, or what can be done for another child who has been wetting the bed. The absence of such alarming symptoms is a plain indication to the parents that the child whose eyes are crossed is in no immediate need of medical attention. Only too frequently do we hear parents say that they cannot afford to have the child's eyes straightened yet, but when the child is old enough they intend to "take him to the eye doctor and have his eyes straightened and fixed up all right." And worse, often this is the advice given by the family physician—to "wait until the child is old enough." Though the child who has worms may suffer untold night terrors, and though another may add more than his share to the housekeeping cares of the mother by persistent bed-wetting, the prognosis for each is favorable, for the worms may be expelled, and the nocturnal enuresis will cease upon the removal of the cause. No unfortunate results in the shape of permanent sequelæ are to be feared in such cases.

Yet it is just such annoying but trivial symptoms as nightmare and bed-wetting that will bring the average parents to the physician for help, while the same parents will allow a cross-eyed child to remain neglected throughout the only years when there is a good chance of accomplishing some improvement of his condition by careful and competent treatment.

It is because not only the laity but a great many physicians in general practice are under the erroneous impression that if a pair of crossed eyes are straightened by an operation this cure is all that could be desired and the trouble has been removed; it is because there is a very prevalent misconception of what crossed eyes—squint—really is; it is because many physicians as well as parents do not know that up to a certain time a squinting eye is becoming progressively blind, and after that time there is almost no hope of being able to do anything which will improve the vision of that eye; so that should an accident later in life deprive the squinter of his good

[1] Read before the Dubuque County Medical Society, June 30, 1902.

eye it will probably leave him to spend the remainder of his days in a practically blind state; and it is because it is so all-important that *early* treatment be instituted in order to accomplish anything toward actually bettering the condition of a case of squint, that I ask your attention to this paper.

It is not my purpose to discuss the varieties of squint, nor to go into the treatment of the condition except where it seems pertinent. If in pointing out some of the dangers of procrastination more careful attention can be secured early in cases of squint, before preventive measures have become possibilities of the past, the object of this paper will have been accomplished. I have omitted the consideration of so-called alternating squint. This will be discussed in a subsequent paper.

Because I want to be sure of being clearly understood in what follows I will speak of several terms that will be used:

Amblyopia—derived from the Greek meaning *blunt sight*—is applied to a condition of impaired vision wherein there is not an actual absence of vision but an obscuration, a loss of the power to see objects sharply. In looking at a large test letter a patient suffering from an amblyopia of a certain degree will be able to distinguish a block of dark hue, but will lack the power of discerning the outlines of the letter so as to be able to say what letter it is. This patient will probably be able to count fingers held before his amblyopic eye at a distance of one meter.

Binocular Single Vision.—When one fixes his gaze on an object at a distance his eyes assume a position which allows the formation of a picture of that object upon the central part of each retina. At the same time pictures of all other objects within the scope of vision are formed upon points of each retina, and these points correspond functionally. The impressions received from two separate pictures, one in each retina, properly blended in the brain, awaken a consciousness of one whole picture only, not of two separate pictures. This is binocular single vision. A disturbance of this blending or fusing faculty will result in double vision—diplopia—a condition in which the brain is conscious of two distinct pictures simultaneously, one from each eye.

Graefe, in observing cases in which no fusion of the images in the separate eyes occurred, attributed this fault to what he termed "antipathy to binocular single vision" (Graefe: Saemmisch, 1880). Worth (Convergent Squint, 1901) thinks this lack of blending of two separate images, one from each eye, into one perfect whole, to be due to the failure of development of what he terms "the

fusion faculty." Savage (Ophthalmic Myology, 1902) in discussing the subject speaks of "the guiding sensation resident in the retina," and goes on to say that through this sensation nine conjugate innervation centers in the brain control the twelve extrinsic muscles of the eyes in obedience to the law of corresponding retinal points. In order to avoid confusion of terms in speaking of this factor of squint, I shall adopt the nomenclature of Worth, and shall refer to the cause of this failure to accomplish binocular single vision as the failure of development of the fusion faculty.

The Faculty of Convergence.—This faculty has to do with directing the gaze of the individual eyes upon the same object. When the object is far distant the call upon the converging power, in order that the axis of vision of each eye shall be directed upon the same point, is a very small one. In fact, for objects more than six meters distant it is so small that we can disregard it and consider the amount of convergence as *nil* and the visual axes of the eyes as parallel. Moving the object nearer than six meters it becomes necessary for the converging mechanism to exercise its power, and at a distance of one-quarter meter from the eyes a plainly discernible condition of crossed eyes exists as a result of the excessive call upon convergence.

The Faculty of Accommodation.—This has to do with focusing the eyes properly for the distance of the object observed. At a distance of six meters the amount of focusing necessary in order that the details may be seen sharply is so small in the normal eye that it can be disregarded and considered as *nil.* As the object is moved nearer the eyes, however, the call upon the accommodating power becomes successively greater, until at a certain point further accommodation becomes impossible. These two faculties are very closely associated, and any interference with one will affect the proper adjustment of the other. In cases where a greater than normal amount of accommodation is necessary in order to focus clearly for a certain distance, there will be a correspondingly greater than normal call upon the convergence. In far-sighted eyes it falls to the faculty of accommodation to overcome the abnormally long focus of the eyes by a correspondingly abnormally powerful effort of accommodation, and coincident with this powerful accommodation is an abnormally powerful action of convergence, rotating the eyes inward toward each other. This intimate association of these two faculties is very important in the consideration of squint.

Fuchs defines squint as follows: "Squint consists of a deviation of the visual axis of one of the eyes from the correct position of

fixation." As Worth says: "This is as accurate a definition of squint as to say that spinal caries consists of a deviation of the spine from its normal position and shape. In a case of squint there are in addition to (1) the deformity (2) a defective development of the faculty of fusion, nearly always (3) a suppression of vision of the deviating eye, in a great majority of cases (4) amblyopia of the deviating eye, and (5) refractive error."

Squint is a condition not of one eye but of *both* eyes, embracing: (1) Deviation from the normal parallelism. (2) Defect in the faculty of fusion whereby the brain should be able to blend into the consciousness of one picture the impressions received from separate pictures in each eye. To relieve the embarrassment of this defect, which, should it remain in this stage, would render clear vision impossible on account of the confusion of double vision, nature helps out of the confusion by (3) suppression of the vision of one eye. After a certain length of time the constant suppression of vision results in (4) amblyopia of that eye, a loss of its power to see clearly. The development of an amblyopia is as natural under these circumstances as is the development of an inability to contract strongly in a muscle which has been unused for a certain length of time. During the period of simple suppression of vision in this eye —before there has been developed any amblyopia—it is possible at any time to call into activity the vision that has been suppressed, by covering the other eye and thus forcing a return of the action of vision. Nature abhors a vacuum, and this is just as true in regard to visual conditions as it is true in regard to atmospheric conditions. On the withdrawal of the vision of the better eye this natural abhorrence of vacuity results in bringing into activity the vision of the poorer eye, no matter how poor that vision may be, in an attempt to supply the deficiency following the covering of the better eye. But after a certain length of time, during which suppression has been constant, we find a gradually encroaching actual loss of the *power to see*. In this stage, even though the other eye be covered, we find that the squinting eye is unable to recall into activity that vision which formerly it had been able to recall under similar conditions. And finally, in squint we find in nearly every case (5) refractive error, a defect in the perfect focusing of one or both eyes.

Remember emphatically that squint is not a muscular affection. Worth reports nearly 1500 cases in whom the muscular power was tested, and in these he found the muscular power of independent outward rotation to be defective in only 7.7 per cent of all cases. Nor is it an affection of the power of focusing the eyes—a refractive

error; nor is it an affection of the visual power of the eyes—suppression of vision or amblyopia. The one essential cause of squint is the inability to accomplish binocular single vision. Any or all of the other factors may be absent; there may be no suppression of vision in either eye, no amblyopia, and no refractive error, but if the power of accomplishing binocular single vision is maldeveloped there is present the one factor which is necessary to the development of squint.

Let us look into the natural history of a case. The child at the age of six or seven months has failed to develop the fundaments of a normal faculty of fusion. There is no outward symptom by which this maldevelopment can be detected at this time, but the faulty development will be shown later by its defects. At this age the first evidences of binocular vision are found in healthy eyes (Worth: Convergent Squint, 1901). But without fusion of images binocular single vision cannot exist. Consequently the child suffers from diplopia depending in amount upon the relative sharpness of the vision of each eye as compared with its fellow. Just as we are unable to *detect* the maldevelopment of the fusion faculty, so we are unable to *demonstrate* the presence of diplopia in so young a subject, but we know that it must exist from the natural order of things. To relieve the confusion of diplopia nature steps in and induces a suppression of the vision of one eye. Often there is a difference in the vision of the two eyes, although not always. When such difference exists the vision of the poorer eye is that selected for suppression. Black illustrates the ease with which suppression of the vision of one eye can be accomplished by recalling the result of looking into a microscope tube when both eyes are allowed to remain open. After a brief interval of confusion the microscope field is seen clearly, and *that field only is seen*. Suppression of the vision of the other eye has occurred. After a period of suppression, the power to see clearly with that eye in which suppression has been constant for so long begins to fail; in other words, amblyopia begins to develop. By virtue of this suppression the child has meantime escaped from the confusion of diplopia—has kept a clearness of vision, but at the cost of binocular single vision. He does all his seeing with one eye. And as time elapses the amblyopia of the unused eye is developing slowly and surely.

At some point in this course of maldevelopment, in some cases early, in others not until very late, a deviation from the position of parallelism takes place. This may be a very gradual change, remaining so slight for months as to pass unnoticed; or a very

sudden one noticed almost at its inception, as in the cases in which a squint first appears after a severe paroxysm of coughing or upon the receipt of some sudden shock, as a fright or traumatism. It is not remarkable that there should exist a lack of parallelism of the eyes under certain abnormal conditions. Granted that there exists some fault in the perfect working of that delicate mechanism by whose action consonant eye movements are effected, we need look no further for a reason to explain a lack of harmony in the associated movements of the two eyes. It is enough to know that no influence is at work to maintain the proper alignment or parallelism of the eyes. The first evidence of maldevelopment must come to us in the shape of deformity—the deviation of squint. Before the onset of a deviation we have no means of detecting the difference between the two eyes of children (except in those rare instances in which the onset of the deviation is deferred until an age is reached when the child's own intelligence makes it conscious of the fact that it is using one eye only in seeing). Mr. Worth says: "How a sudden fright, a blow on the head, or the straining of whooping-cough upset the converging mechanism I do not know, but these are powerless in the presence of a normal fusion faculty." Of 1278 cases Worth was able to ascertain the age at which deviation first appeared in 809, viz.: before one year of age, 12½ per cent; between one and two years of age, 17½ per cent; between two and three years of age, 24½ per cent; between three and four years of age, 19½ per cent; between four and five years of age, 11 per cent; between five and six years of age, 7 per cent; and after six years of age, only 7½ per cent. This shows that 74 per cent of all squints reveal deviation of the squinting eye before the end of the fourth year. He also found that the deviating eye always at first had the ability to fix its gaze upon an object when the other eye was closed—in other words, had the power of fixation.

If by the end of the sixth or seventh year no sort of binocular single vision has been established—*i.e.*, no development of the faculty of fusion has taken place—our first effort should be directed toward recalling into activity the suppressed vision, preventing further amblyopic deterioration, and combating the existing amblyopia. To quote Savage (Ophthalmic Myology, p. 450): "The chief object in view in the treatment of esotropia, whether by lenses or by operations, is the establishment of binocular single vision."

This can be done in cases not over five or six years of age, often with a surprisingly immediate success, by properly enforcing the use of the poorer eye for near vision. The same tactics which were

operative in bringing about the deterioration are made use of to effect the improvement of the unused eye, by simply reversing the order of things and preventing the better eye from any longer monopolizing the visual abilities. We must demonstrate to the unused eye that it really has the ability to see if only it is given an opportunity to do so. To impress upon the eye this consciousness of its own ability it is necessary to place before it a lens correcting all refractive errors, and then to cripple the visual abilities of the better eye to such an extent as to prevent it from any longer forcing the poorer eye to suppress its vision; in other words, we must bring about a reversal of the old order of things, the result of which reversal shall be that that eye which was formerly the poorer shall have the sharper vision of the two, and thus will be allowed to prevail in the struggle for visual supremacy. Mr. Worth has suggested an improvement over the awkward method of bandaging the good eye. He accomplishes the same results by instilling a drop of mydriatic solution in the good eye only, once or twice daily. In paralyzing the accommodation of one eye only we relieve in great measure as much of the excessive convergence as has depended upon motor impulses received by virtue of the exercise of that accommodation. The result of this relief is often quite evident at once in the improvement of the relative positions of the two eyes. This is not a real correction of the difficulty, however, as the eyes will return to their former malposition just as soon as motor impulses to the muscles of convergence are again received from the mechanism of accommodation—in other words, just as soon as the mydriatic is stopped.

This bringing the vision of the poorer eye back into activity from its former condition of suppression is but the first step in the right direction, and although it is a most necessary prerequisite in the establishing of binocular single vision, it only opens the way to the second and most important step in the development.

Just as there is a natural desire for the performance of any other function normal to the organism, so there is a natural desire for binocular single vision. In cases in which owing to developmental error the function has never been established, this natural desire has never been awakened. If we can succeed in bringing about this awakening we will have won to our aid a most powerful factor in bringing about the development of the fusion faculty, and will have made a long stride toward our goal, the establishing of binocular single vision.

Having demonstrated satisfactorily to the unused eye its ability

to see if only it is given an opportunity, and then having given it the most favorable opportunity by placing *before that eye only* a lens correcting any refractive error, the child soon feels the desire for fusion of the separate images now for the first time coming from both eyes. He shows this tendency by seeing two pictures, one with each eye, on looking into a stereoscope; and later on in the development, by being able to combine two of the simplest stereoscopic pictures into one, very imperfctly perhaps at first, but with increasing success at each attempt.

Having reached this stage of success there remains only the necessity of pursuing with conscientious perseverance a course of properly selected orthoptic exercises, and of maintaining a judicious control over the visual abilities of the better eye.

If this treatment is begun early enough we may hope with good reason to establish a very strong and stable binocular single vision. In cases in which stable binocular single vision has been established glasses can be discarded at about the age of puberty, to be worn subsequently for near work only. This of course is not true of cases in which there exists a very high degree of refractive error. Such patients need glasses for constant use even though they have never squinted. If, however, treatment has not been begun until late, though we may still be able to establish binocular single vision it will be of such unstable character that it will not be able to withstand the strain of uncorrected refractive error. Black says that in patients in whom a weak, unstable, binocular single vision has been established correcting glasses will be needed for constant use always; for by relieving by a correcting lens the strain upon accommodation, and through it the excessive call upon convergence, we are able to maintain a position of parallelism of the eyes, and in these cases this is the only way correct parallelism can be maintained.

I do not know just at what age we ought to give up hope of remedying the error of development in a case of squint. It has been placed at the end of the fifth year by Mr. Worth, of London, to whom we are indebted for a most careful and elaborate study of von Graefe's theory of squint. But of this I am certain, the younger the child brought to treatment the better his chance of developing the faculty of fusion, of accomplishing binocular single vision, and the better his chance of still having a useful amount of vision left in his poorer eye should any accident later in life deprive him of the vision of his better eye.

Mr. Claud Worth, of London, has done a very valuable work in the study and elaboration of the theories taught by von Graefe in

regard to squint, and the medical profession is under a great debt to him for the years of close observation and careful study of these cases, as well as for the results of his mechanical genius in devices such as his amblyoscope, his strabismometer, and his ivory ball test of vision for very young children. I am very deeply indebted to Dr. N. M. Black, of Milwaukee, for having brought to my hand copies of Mr. Worth's articles on convergent squint which have been quoted in this paper, and also for a copy of his own very excellent paper on the same subject recently read before the Milwaukee Medical Society.

If this paper has brought any conviction to the minds of its hearers it should have brought out two points very clearly: (1) The time for beginning the treatment of squint is *at once;* (2) it is the duty of every physician to impress upon the minds of the parents *the great dangers of delay.* I will close with report of cases illustrative of a few points that have been discussed:

Case 1.—Male, aged 9; Wills Eye Hospital, service of Dr. S. D. Risley. Right eye enucleated one year ago; left eye squinted since one and one-half years of age. No improvement of vision has occurred during the enforced use of the left eye since the loss of the right eye one year ago. He can only count fingers at two meters distance. It is not improbable that had the boy received careful treatment early in life the accident which deprived him of the vision of the right eye would still have left him with sufficient visual acuity in his left eye to be able to read with the aid of glasses.

Case 2.—Male, aged 33 years, hatter by trade. Right eye enucleated three years ago after a scissors injury. The left eye squinted first at the age of three years, but eventually returned to a position of parallelism as he became full-grown. No improvement of vision has occurred during the enforced use of the left eye since the loss of the right eye. He has been compelled to attend a school for the blind in order to learn a trade.

Case 3.—Male, aged 55 years, squinted from infancy, right eye turning down and in to an extreme degree. The squint gradually disappeared, and after 13 or 14 years of age his eyes were again straight. But he has never been able to see with his right eye, which skiascopy shows to be far-sighted, with some astigmatism. Vision in this eye equals counting fingers at one meter distance, and the lens correcting this refractive error fully brings up the vision only to counting fingers at two meters distance. He has had to go through life in constant fear of losing the vision of his left eye, in which case he would be practically blind.

Case 4.—A sister of Case 3. History is almost exactly similar to that of Case 3. Cases 2, 3, and 4 illustrate the fatal results of allowing a child to "outgrow his squint." It not infrequently happens that a spontaneous restoration of the parallelism of the eyes occurs, but in the meantime irreparable damage to vision has been done.

Case 5.—Male, aged 58 years. Right eye amblyopic, but never squinted. Patient says he never used this eye for seeing. He has been fitted with glasses several times, but the ophthalmologist always neglected the poorer eye, contenting himself with placing a good correcting lens before the better eye only. Skiascopy shows the poorer eye to have a moderate degree of mixed astigmatism. Vision of this eye equals the counting of fingers at two meters distance, and the lens correcting his refractive error fully brings up the vision of this eye only to counting fingers at six meters distance, or the reading of the largest test letters, although owing to failure of his having developed the power of fixation, this is not a constant value.

Case 6.—Female, aged 8 years. Mother brought her with the statement that she was "blind in her right eye." Vision in this eye was reduced to being able to count fingers at five meters distance.

Cases 5 and 6 showed no external evidence of there being any difference between the two eyes, and yet these were cases in which squint might have developed at any time, as there was present no binocular vision, no fusion faculty, no influence at work to maintain parallelism of the eyes; only exemption from some exciting cause avoided the onset of a deviation. The course of treatment alluded to in this paper was pursued in Case 6; her visual power has been brought up to reading large type at six meters distance and reading large newspaper type at a reading distance of 50 centimeters. So far she has failed to accomplish binocular single vision, but at times a diplopia has been noticed, which indicates that the suppression of vision and the amblyopia of the unused eye are yielding to treatment. I have strong hopes of being able to establish some sort of binocular single vision ultimately, although it will never be of a strong and stable character. She is still under treatment and is showing progressive improvement at each visit.

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Addendum.—Since writing the above over one month has elapsed, during which time the patient, Case 6, has been using

orthoptic exercises three times daily, and at the same time control has been maintained over the visual abilities of her better eye. She has developed the faculty of fusion to a very satisfactory degree, and of course with this she has accomplished binocular single vision. She attended school for a time during the period her better eye was under the influence of a mydriatic, and was able to do the necessary reading with her poorer eye aided by a full correcting lens. This, however, she did not continue on account of distressing asthenopic headaches which developed after the use of that eye for so much near work. The last time she was seen her vision in the poorer eye equaled reading type XII at six meters distance, and she was able to read steadily the smallest Snellen type at a reading distance of 40 centimeters.

NOTE.—No reference has been made to those cases of amblyopia and squint in which scotoma exists and presents an insuperable obstacle to binocular single vision. Reference to operative procedures has purposely been omitted. The writer has discussed these questions in another article. The above represents a study of the general conditions which are of importance in considering the causes, the course, and the results of convergent squint. Free use has been made of the writings of Black, Bloch, Fleichsig, Fuchs, W. Preyer, Savage, Schleich, Schweigger, Steffan, Straub, von Graefe, and Werth in this study of the subject.

BOOK REVIEWS.

A Laboratory Guide in Elementary Bacteriology. By William Dodge Frost, Instructor in Bacteriology in the University of Wisconsin. Second Revised Edition. Price, $1.65. Madison, Wisconsin: Published by the Author. 1902.

This book is so thorough, so systematic, and so complete that it leaves scarcely anything to be desired. It is a combination text-book and note-book, and on opposite pages explains to the student the work he is expected to perform, and provides a systematic method for entering his own notes upon the work done.

Of Part I, the first chapter, which deals with General Bacteriology, gives full directions for the preparation of apparatus and media for the cultivation and observation of bacteria; the second chapter, upon the Physiology of Bacteria, gives directions for the study of their metabolic products and vital peculiarities; the third chapter explains the systematic arrangement of organisms and gives tables for their separation into groups; the fourth chapter outlines the complete study of bacteria by an analysis of the life history of a chosen few; the last chapter deals with the analysis of air, water, soil, milk, etc.

Part II deals with Medical Bacteriology, and contains excellent brief descriptions of the important bacteria, with recording sheets for the student's own observations, methods of animal inoculation and investigation, methods of bacteriological diagnosis, and for detecting the presence of pathogenic bacteria in water and milk.

There probably never has been a book to cover the same ground. It can be used by those taking brief courses of instruction, or those doing advanced work. A physician with the least rudiments of the subject in his mind could give himself an excellent course of instruction by carefully following its suggestions. It is not a sufficient *text-book*, but by references to well recognized standard works makes itself exceedingly useful as a guide to those desiring to study the subject.

Rational Hydrotherapy. By J. H. Kellogg, M.D. Second Edition. Philadelphia: The F. A. Davis Company. 1902.

This large work of 1193 pages easily occupies the leading place in American hydriatic literature. The title speaks of it as "rational hydrotherapy," from which we would imply that there is probably an irrational hydrotherapy. Just exactly what that is we do not know; one would judge from reading this book that every method of applying water to the human system is described.

The work is devoted to an exposition of the physiological and therapeutic effects of hydriatic procedures, and the technique of their application in the treatment of disease. The historical development of the subject is briefly touched upon, and then follows water, air, heat, and light in their relation to hydrotherapy. The next division deals with anatomy and physiology in relation to hydrotherapy, and the physiologic effects of external and internal application of water.

Part II deals with the general principles of hydriatics, the therapeutic

effects of different applications, and the general rules and principles relating to the employment of hydrotherapy.

Part III, including nearly one-third of the work, is taken up with the technique of hydrotherapy. In this part we have a description of the method in which water is applied to different parts of the body or to the whole body, and the different forms of irrigation of the cavities. This forms what in ordinary parlance would be termed the remedies.

In Part IV, under the heading "Hydriatic Prescription Making," we have a description of the various hydriatic measures applied to particular disorders.

COMPEND OF SPECIAL PATHOLOGY. By Alfred Edward Thayer, M.D., Assistant Instructor in Gross Pathology, Cornell Medical College; Pathologist to the City Hospital; etc. Containing 34 Illustrations. Pages 322; 80 cents. Philadelphia: P. Blakiston's Son & Co. 1902.

In the July number of MEDICINE we have already spoken kindly of the first volume of this work, treating of General Pathology. The present volume treats of Special Pathology, and gives a very good account of the morbid lesions of the organs, with sufficient mention of both their anatomy and physiology. The matter is well distributed, the treatment of the subjects corresponding with their importance.

We regret that on page 128 the misleading statement that "Diphtheria antitoxin is prepared in flat-bottom sterile glass flasks" opens an otherwise fair description of the process. We also observe that the method of testing antitoxin is taken from old writings upon the subject, and Ehrlich's method of accurately estimating the strength is omitted. It seems to us quite out of place to introduce the subject of antitoxin into the book at all.

On page 187 we notice that the facets upon gall-stones are ascribed to the result of "mutual attrition," which, while possible, we regard as very doubtful, and not in accord with the best opinions on the subject.

However, as a whole, the work is a useful one for students, and for practitioners preparing for State board examinations, and knowledge of its contents will be sufficient for almost all purposes.

MASSAGE AND THE ORIGINAL SWEDISH MOVEMENTS. By Kurre W. Ostrom. Price, $1.00. Philadelphia: P. Blakiston's Son & Co. 1902.

This small work on massage by Ostrom has been before the profession for some years. The fifth edition has been revised and enlarged so that it fairly represents the present condition of the subject. Since the first edition the author has gained a better knowledge of the value of massage as a remedial measure and of the actual wants of nurses by his experience as a teacher in the various hospitals of Philadelphia. The work is thoroughly practical. In closing the work the author offers some excellent suggestions upon massage. There is no reason why such a powerful remedial agent as massage should not be fully controlled by the medical profession in this country as it is in Europe. Massage and movement treatment should be applied only by educated and properly trained persons with due regard to the physician's directions, and there should be a place where skilful operators could have an opportunity to pass an examination, and for registering and protecting not only themsleves and the profession, but the general public as well.

The work is adequately illustrated. A careful study of its pages will give one a fair idea of the various movements employed in massage, and of the special applications of these in the treatment of specific diseases.

PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of Gustavus P. Head, M.D. Volume IX, Dealing with Physiology, Pathology, Bacteriology, and Anatomy. Edited by W. A. Evans, M.D., Adolph Gehrman, M.D., W. T. Eckley, M.D., and Bernard Fantus, M.D.

The first portion of this volume is taken up with a description of the antibodies, or antitoxins. This is followed by a description of the precipitins, agglutinins, lysins, and cytotoxins. Unquestionably these subjects are the leading topics for the year. The writer summarizes the matter by the statement that a new biologic law has been established, namely, foreign proteid molecules acting on certain living cells produce chemical bodies having a specific relation to the substance under the influence of which they were produced; such substances may be called anti-bodies.

In the article on pathology no general statement of the trend of pathologic research is given, but a large number of abstracts of original contributions in this department are included.

In bacteriology we are told that no new nor exceptionally novel observations have been made, but on the whole there has been satisfactory progress in the elaboration of details.

THE PRINCIPLES AND PRACTICE OF BANDAGING. By Gwilym G. Davis, M.D. Price, $1.50. Philadelphia: P. Blakiston's Son & Co. 1902.

This volume is based on a previous one by the author issued in 1891. The illustrations have been redrawn and the manuscript rewritten, so that it is practically a new book. No attempt has been made to describe all bandages, as surgeons modify them according to the emergencies of the case, but those bandages which embody principles are illustrated in detail. The writer divides the work into three parts, the first dealing with roller bandages, the second with tail bandages or slings, and the third with handkerchief bandages.

The first part of the work describes the method of preparing bandages, followed by a description of the application of bandages to the different parts of the body. The author employs non-technical language, which will make the book especially useful to nurses. It will also be valuable to hospital internes and surgical dressers in the out-patient department.

LEADING ARTICLES.

THE CHEMICAL NATURE OF TOXINS AND ANTITOXINS.

From time to time attempts have been made to identify the chemical nature of the antitoxic substances contained in the blood of immune animals, but up to the present all have met with signal failure; the antitoxicity being so subtle in its characteristics that it was at one time thought to be a force rather than a substance, and that it pervaded the serum as magnetism pervades steel. It has even been disputed whether the antagonism between toxins and antitoxins was purely chemical in nature, although since the work of Ehrlich and his associates the evidence in this direction has been very strong.

The most recent writing upon the subject is by Viquerat, of Moudon, Switzerland, who published in the *Centralblatt für Bakteriologie, Parasitenkunde, und Infektionskrankheiten*, vol. xxxi, No. 12, p. 581, May 14, 1902, a paper upon "Toxins and Isomerism." The investigations reported in the paper were suggested by the well known fact that diphtheria antitoxin sometimes fails in action where a beneficial effect is to be expected and the conditions for its operation are apparently good, while on the other hand it sometimes produces beneficial results in other diseases, such as whooping-cough, pneumonia, scarlatina, and pyogenic infections, where no good result is to be looked for. This led Viquerat to make a careful chemical study of the antitoxic serums which were found to contain lactates, which normal serums do not. With this exception no chemical difference was detected between normal and antitoxic serums. Inferring from this that lactic acid might be of importance, a comparative investigation of the toxin of the diphtheria bacillus was next made.

It is well known that diphtheria cultures become acid during the first few days of their growth. It was found that this acidity depends upon lactic acid, formed by the fermentation of carbohydrates contained in the bouillon. When the carbohydrates are exhausted, the bacillus is obliged to seize upon the peptones contained in the medium, transforming them in part to ammonium, so that the lactic acid previously formed is neutralized and the bouillon again becomes alkaline. During the strongly acid condition of the culture medium, the diphtheria bacilli gradually increase in number

and form an increased quantity of diphtheria toxin, dying out after a sojourn of three or four weeks in the thermostat. Such an alkaline bouillon contains much strong toxin. What has now taken place, and whence has the poison originated? Can it be through the solution of the bacillary bodies or through a poisonous secretion from the same that an enzyme like diastase, whose composition is unknown but whose effect is well known, has been formed? If so, how are the bacilli dissolved? All of the bacteria experimented upon were found to dissolve quickly in a solution of lactic acid neutralized by ammonium, the solution taking place with a rapidity corresponding to the concentration of the salts. Ammonium lactate is, however, not poisonous, and if it dissolves the bacteria, its action must be ascribed to the purely chemical peculiarities shared as well by other ammonium salts, amins, alkalies, and acids.

Viquerat believes that in the case before us we have to do with an isomerism. The lactic acid formed from the carbohydrates of the diphtheria culture is transformed into a paralactic acid, a transformation which explains the thus far insolvable problem concerning antitoxin. As long as the diphtheria culture furnishes fermentation-lactic acid it is not toxic, but so soon as paralactic acid is formed, it becomes so. This muscle-lactic acid, which is a dextro-rotatory paralactic acid, is the diphtheria toxin and occurs in diphtheria cultures in the form of paralactate of ammonium. It is but slightly soluble in water and alcohol, is amorphous, dialyzes with difficulty, and occurs as a gummy or slimy amorphous substance, microscopically recognizable only through its dextro-rotatory calcium or zinc salts.

Experiments upon animals show that the ordinary fermentation-lactic acid is entirely harmless, while on the other hand the paralactic acid has a peculiar and characteristic effect.

The chemical reaction of the two forms of lactic acid is interesting. A mixture of the dextro-rotatory and sinistro-rotatory lactic acid forms an optically inactive, so-called "fermentation-lactic acid." The salts and esters of the sinistro-rotatory lactic acid rotate toward the right, and those of the dextro-rotatory paralactic acid toward the left. The mixture of these two optically active salts or esters in equal parts forms, on warming, inactive fermentation-lactic acid salts or esters. The lactic acid present in diphtheria antitoxic serum as the result of the process of immunization is the optically dextro-rotatory salt. If it be mixed with the optically sinistro-rotatory paralactic acid salt, a harmless inactive fermentation-lactic acid — neutralization — results. The dextro-

rotatory paralactic acid is the diphtheria toxin and the sinistro-rotatory acid is the antitoxin. Should it be desired to separate these two active forms of lactic acid it can be done by neutralizing ordinary fermentation-lactic acid with ammonium. The resulting inactive ammonium lactate after the addition of dextrin or starch is seeded with *Penicillium glaucum*. The mold uses up the sinistro-rotatory lactic acid, leaving the dextro-rotatory paralactic acid remaining.

Viquerat found that the active lactic acid played an important part in nearly all of the infectious diseases. In diphtheria the bacillus first forms the fermentation-lactic acid, responsible for the formation of the membrane, and later paralactic acid, which causes diphtheritic paralysis. When the dextro-rotatory paralactic acid salts contained in the diphtheria antitoxic serum are injected into the patient suffering from diphtheria, in sufficient quantities, it unites with the sinistro-rotatory lactic acid salts to form optically inactive harmless fermentation-lactic acid salts, and the disease is overcome. The optically active lactic acid is not germicidal, for the diphtheria bacillus grows quite well in its presence. In the body it acts toxically and may accumulate in large quantities.

Viquerat observed four phases in the development of cultures of the diphtheria bacilli: First, that in which fermentation-lactic acid is formed from carbohydrates; second, in which ammonium and paralactic acid are formed from peptone; third, that in which the diphtheria bacilli are dissolved; and fourth, that in which toxin is formed.

Concerning the treatment of infectious diseases Viquerat's experiments confirmed his opinions. Tuberculous guinea-pigs completely recovered in three weeks when treated with paralactic acid. The immunity of the muscles from tuberculosis is thought to depend upon the muscle-paralactic acid which they contain. The muscle juice of Richet and Hericourt as well as Liebig's meat extracts cured tuberculosis in dogs because of the muscle-paralactic acid that they contained. By the use of paralactic acid, Viquerat cured in a short time anthrax, diphtheria, tetanus, typhoid fever, and various suppurations. He also operated several times without exercising any aseptic or antiseptic precautions but with the use of paralactic acid, and had no resulting abscesses or evils.

The theory of treatment seems to be very simple. If a pathogenic microörganism produces the sinistro-rotatory lactic acid salt the dextro-rotatory salt must be prescribed, and *vice versa*. It is believed that the erroneously so-called pyocyanase of Emmerich

and Loew is nothing else than a sinistro-rotatory lactate of ammonium from the paralactic acid.

It is well known that in tetanus the muscular tissue has an acid reaction, because the fermentation-lactic acid that is formed in considerable amount cannot be immediately neutralized by the blood. Sinistro-rotatory lactic acid salts are therefore thought by Viquerat to be the best antitoxin.

It has long been the hope of those who use antitoxins for the treatment of disease to get away from the undesirable blood serum. Therefore, the attempts at chemical isolation of the antitoxin activity have been watched with interest and expectation. Should these startling observations of Viquerat be correct, and should it be possible by the action of the *Penicillium glaucum* upon ammonium lactate to produce the necessary paralactic acid salts, and should it be shown that Viquerat's observations concerning their beneficial effects upon animals suffering from infectious diseases are as described, we shall find in this contribution one of the most important additions to medical knowledge, if not the most important since the elaboration of the blood-serum therapy.

EDITORIAL COMMENT.

INSURING A PATIENT'S LIFE WITHOUT HIS CONSENT.

A reference in the European despatches to the custom of insuring the King's life has excited a good deal of curiosity in this country, where such insurance is unknown. In some cases they seem to be gambling contracts pure and simple, while in others they have an element of insurance in the fact that the policies are taken out by tradesmen whose business is chiefly dependent upon a successful London season, or the increased purchases brought about by the coronation ceremonies.

Case and Comment, June, 1902, discusses insurance upon a person's life without his consent. The decisions in this class of cases are not numerous. Some are to the effect that a creditor may insure the life of a debtor without the latter's consent, for the surety of the obligation. Insurance on the life of an infant has been sustained in many cases where the infant's consent was not possible. Infant insurance is the only kind, without the consent of the insured, that has been established by legal decision in the United States. There are statutes in some States limiting the amount of this infant insurance, which by implication sustain the right to insure within those limits. The question of consent of the insured has not been discussed, but in upholding infant insurance the courts by implication have held that consent was not necessary. While there are dicta in two or three cases to the effect that a creditor can insure the debtor's life without the latter's consent, there are no direct authorities in support of the proposition. In the English case of von Lindenau *vs.* Desborough (3 C. and P., 353) insurance on the life of Duke Frederick IV. was taken to secure a bank at a time when his mind was so impaired that his consent could not be obtained. The court did not discuss the question of consent, but decided against the policy on the ground of misrepresentation in obtaining it. There is, in fact, no decision in favor of a creditor's right to such insurance without the debtor's consent. There are cases in which the contrary has been decided, the courts holding explicitly that a policy was void unless the insured gave consent.

The general practice of insurance companies in this country not to issue policies without a medical examination has operated to pre-

vent the raising of the question of consent in such contracts. In addition to the numerous policies taken out upon the life of the late Queen Victoria and on that of King Edward VII., it has been recently reported that the stock-brokers have large insurance upon the life of J. Pierpont Morgan. This latter must have been taken without the consent of the insured.

The main evil in all wagering policies is not the element of gambling, but the temptation to crime. The taking of risks is the very essence of insurance, but the risks contemplated are honest risks, and not those which may be dishonestly caused by the insured. When there is much to gain by the destruction of insured property or life, it may be brought about by illegitimate means. The public interests against arson and murder far outweigh those of mere wagers, and the great number of instances in which insurance companies are called upon to pay dishonest losses furnish over-abundant proof that a rule of law which should recognize the validity of insurance without insurable interest would seriously conflict with public policy.

It would seem that insurance without the consent of the insured is, in effect, to put the person insured under a possible danger without his consent. If any exception to this rule is made, it must rest upon the peculiar relations of parent and child. The scandals that have arisen in the past years from this class of cases show the danger of the practice. The only insurance of that kind that seems legitimate is for indemnity against the actual expenses of sickness and burial, so that the amount of the insurance can furnish no inducement for crime.

A class of English policies upon the lives of prominent persons is a relic of the feudal system. The tenant under the feudal system, in addition to his annual tribute to the lord, had to pay a fine on the lord's death. This became modified so as to require the payment of the fine on the death, not of the lord, but of some prominent person, such as the sovereign, whose death would be a matter of public knowledge. As the fine might be a considerable burden, it became a common practice for the tenant to take insurance on the life of the queen, or other person on whose death the fine was payable, in order to insure himself against the liability. These leases were called "Queen's leases."

The general principle of such insurance is bad, and becomes truly vicious if it is in the nature of a gambling contract. If taken by a tradesman or other person to indemnify him against actual loss, as was the case in the land tenure cases, then it is less objec-

tionable. The general principle of no insurance without the consent of the insured, and that not beyond the insurable interest, would seem to be the safest procedure.

SUTURE OF THE SPINAL CORD.

It is a generally accepted doctrine that in injuries of the central nervous system there is no regeneration of the nerve tracts, though such restoration after section has been observed in the lower animals. The experimental evidence in favor of regeneration of the spinal cord after complete severing is very slight, hence the report of F. T. Stewart and R. H. Hart in the *Philadelphia Medical Journal* of June 7, 1902, in which a severed spinal cord was sutured and there was a partial return of function, should be received with caution, and the evidence upon which it is based should be carefully weighed.

The patient, a young woman, was shot with a 32-caliber bullet, which entered the spinal column at the left of the seventh thoracic vertebra. It is stated that "there was immediately a complete abolition of motion and sensation below a line transecting the lower part of the tenth dorsal spine," etc. The superficial and deep reflexes could not be elicited. In the report of the case no mention is made of the condition of the sphincters, nor is the method of testing the sensation described. The most that can be said of this preliminary examination, which is highly important in estimating the possibility of regeneration of the cord, is that the examination is imperfectly described. The operation was performed three hours after the wound was received. At the operation a rent was found in the membranes through which the bullet could be seen, a few fragments of bone lying between the ends of the severed cord. After removing the bullet, the fragments of bone, and the lacerated nerve tissue, the distance between segments of the cord was three-quarters of an inch. The wound was flushed with salt solution, and the ends of the cord approximated with three chromicized catgut sutures. One suture was passed through the entire thickness of the cord, and the other two transversely. The dura mater could not be approximated.

On the fifth day the patient complained of pain in the right knee, and she could "feel a squeezing of the calf as a pulling sensation in the back." If the superficial nerves of the legs had been severed and then united by suture, there is no question of the possibility of their regeneration, but the patient would not have been

able to feel anything at the end of five days. The severing of the pathway in the spinal cord, while universally admitted to have slight if any power of regeneration, would be shown in this case to have a greater power than the superficial nerves.

We are disposed to doubt the premises of the writers who claim a regeneration of the pathway of the spinal cord within five days after it has been severed and separated by a space of three-quarters of an inch. Suppose that the operators in this case were mistaken as to the spinal cord being completely severed. That is a possibility that might occur in any gunshot or other injury to the spinal cord. A cord may be contused and lacerated, with a complete abolition of function below the injured part. To conclude from such symptoms that the cord has been completely severed, and that an operation is of no value, is going too far. In most cases of gunshot or other injury to the cord, the patient should have the benefit of a surgical exploration. There is a possibility of the cord being pressed upon by a spiculum of bone, or involved in a hemorrhage to which open incision might give relief. Notwithstanding the case which we have considered, we doubt the advisability of operating in case the cord is completely severed; but the difficulty is always one of diagnosis, and where there is this question the patient should always have the benefit of the doubt, and the spinal canal should be opened and inspected.

AFTER THE INSTITUTION, OR HOSPITAL, WHAT?

A curious bit of legislation is found in the Illinois statutes relative to the commitment of the insane. Notwithstanding strenuous efforts on the part of the medical profession to secure a law which would facilitate the commitment of the insane to institutions appropriate for their care, the legislature has persistently surrounded the proceedings with so many safeguards as to make it in its terms practically equivalent to a criminal trial. A person is "accused" of insanity, is brought to trial, and is finally committed for this "offense." The legislature, notwithstanding the fact that more than 95 per cent of mental cases are in public asylums surrounded by every safeguard, subject to the inspection of the trustees and the State Board of Charities, has deemed it necessary that such a cumbersome legal procedure should be employed lest a complacent physician and a designing relative might incarcerate some sane person in an asylum.

Once in the asylum the legislature, through its laws, loses all

interest in the lunatic. Aside from the provision in the statute which says that a superintendent shall be fined who detains a sane person in an asylum, there is no provision for the regular examination of those in institutions or for releasing them when recovered, excepting the bare chance of some friendly relative on the outside bringing an action under the habeas corpus act and so securing their release. A number of times this law has been invoked to release persons from an asylum, but in every instance, we believe, where it was sustained, the individuals were insane, notwithstanding the ruling of the court. In no instance has a superintendent been charged with detaining a sane person in an asylum.

We feel safe in saying that there are a considerable number of patients in our State institutions who with a little assistance would be able to live outside. Many of them are not as strong mentally as they should be, but their mental disturbance is of a character that does not require their incarceration in a closed institution. At the time they were committed to an asylum their condition was such that their friends could not care for them at home. After the commitment the home life is adjusted upon the new basis, and if a period of two or three years has elapsed interest on the part of the relatives wanes, and it is difficult for asylum officers to get patients who are worthy of an outside trial taken away. England is far ahead of this country in its philanthropic efforts to assist those who have been in institutions. The Association for the Aid of Discharged Prisoners has done a remarkable work in securing employment for men after they have been turned out of prison. At present, practically nothing is done in this country to that end. The State of Illinois supplies its prisoners with ten dollars and a new suit of clothes and expects them to lead honest lives afterward. If they do not obtain employment at first, which is often difficult with the stigma of prison life behind them, they again drift into criminal life, only to be reincarcerated. A somewhat similar association is needed for the release of the insane, and, indeed, for the convalescents who are constantly turned out by our general hospitals. These are often weakened in mind and body by a prolonged illness. They are no longer proper inmates for a hospital; at the same time they are not strong enough to resume their ordinary avocations. Many of these should be provided with a residence in the country for a few weeks, which would restore them to health and usefulness. A recent benefaction of Mr. John M. Burke, of New York, has placed four million dollars in the hands of a board of trustees to meet this want. He sets an example which it is to be hoped will be imitated in other

large cities, and that the plan of endowing charity pure and simple, and not building monuments of stone and brick, will prevail to a greater extent in the future than it has in the past.

THE TIME FOR OPERATION IN APPENDICITIS.

Among the recent contributions is that of George W. Crile in the *Cleveland Medical Journal* for September, 1902. He reports 372 operations, and draws the conclusion, in which he is in accord with Richardson, Ochsner, and Treves, that there may be a time in acute cases too late for early operation and too early for late operation. In cases in which for any reason operation is not performed, the gastro-intestinal tract is kept absolutely at rest, and if operative treatment is not to be considered, morphine is given to control pain. Cathartics are to be avoided, and if food or a liquid is given, it should be administered by rectum. Vomiting is to be controlled by lavage. The success of these methods is amply attested by the low rate of mortality in the whole number of cases, and especially by the want of mortality in the interval and early operations. In the mortality table the contrast between the cases operated on in the interval in the chronic stage, while the infection is still limited to the appendix, and the cases in which the infection has passed beyond the appendix, is marked. In the former there were 134 operations without a death; in the latter, 188 with 21 deaths. The convalescence in the first group was remarkably free from complications, averaging only about two weeks, and in none did hernia develop. Of the second class of cases, of which there were 188 operations, there were 21 deaths, a mortality of 11 per cent. In this group the convalescence was prolonged and many of the patients were septic. In more than one-fourth of the drainage cases hernia at the site of the old scar appeared within the first year following the operation. In severe cases toxemia persisted long after the patient recovered from the operation.

These statistics of Crile lend strong support to views expressed editorially in this journal, namely, that early operation in appendicitis should be the physician's first recommendation as soon as the diagnosis is made, and usually if the early symptoms are heeded it will be found that the inflammation has not extended beyond the appendix. Then an operation can be performed with safety, and rapid convalescence can be looked for, with freedom from complications. If, however, the patient will not consent to early operation, or the case is seen at a time when the inflammation has probably

involved the tissues outside of the appendix, then taking a large series of cases together the most lives will be saved by placing the patient at absolute rest with external applications to the abdomen, the withdrawal of food, the administration of morphine, and the limiting of peristalsis to a minimum. This treatment is for the purpose of limiting the affection so far as possible in the hope that an interval operation may be done when the conditions will simulate those found in the first few hours of appendicitis, with its favorable mortality rate and freedom from complications.

We now and then see views advanced contrary to the foregoing, teaching that an operation should be done whenever a case of appendicitis is seen, and regardless of the condition of the patient. The policy of deferring the operation is questioned, as it is said to be impossible to distinguish between severe inflammations in this region and those of the benign character. There may be an occasional case of this kind upon which the argument may be advanced that operation is to be performed as soon as the case is seen, and regardless of the conditions. When, however, a large series of cases are analyzed, it will be found that those operators who endeavor to secure the most favorable conditions for operation will have by far the lowest mortality rate, and if we include in this favorable estimate the freedom from complications, we have a sum total which is immensely in favor of a more conservative management of acute cases of appendicitis.

THE TYPHOID EPIDEMIC IN CHICAGO.

The typhoid epidemics of Chicago in the past have, for the most part, been due to a contaminated water-supply. Heavy rains which have washed the sewers and emptied their contents into the lake have preceded most of the epidemics. The origin of the present epidemic, which is said to be quite as severe as any that has occurred in the history of the city, seems like the others to have been consecutive to the heavy rains of the past season. Unlike the others, it came very much earlier in the year, and its heaviest incidence fell upon what are known as the river wards, a part of which district is supplied with water which has always been the freest from contamination.

This district in which the typhoid infection started was overflowed by sewage due to the backing of the surface water in some of the larger sewers, so that a large area was inundated and the sewage spread out over the surface of the ground in cellars,

underneath sidewalks, and in other excavations. The association of the typhoid epidemic with this unsanitary condition was so close that the relation of the two cannot be ignored. The epidemic over this area was concentrated, almost every house having some cases, and if a map were prepared showing the prevalence of typhoid fever, it would be found to be almost confined to this district. The health authorities in investigating the matter came to the conclusion that this sewage overflow was responsible. In following out these studies it was found that food contamination was extensive, particularly fruits and other products which are exposed. The contamination was probably brought about by flies; which were very numerous in the overflowed area. It is felt, owing to the severity of the epidemic, that it is only a question of time till the water-supply is contaminated, when the epidemic will become wide-spread.

The lesson taught by the epidemic of typhoid of the current year in Chicago is the importance of insects in the distribution of the infection in contaminating food, especially such as is openly exposed, like fruit and milk, where it is kept in open vessels at room temperatures. Extensive bacteriologic tests were made of fruit that had been exposed for sale, and in a large number of instances the typhoid bacillus was found.

ABSTRACTS.

MEDICINE.

Inflammation of the Diaphragm Complicating Pneumonia. — ROHRER, C. W. G. *Maryland Medical Journal*, vol. xlv, No. 9, p. 391.

Inflammation of the diaphragm as a complication of pneumonia seems to have been overlooked by systematic writers. It is important, as the clinical symptoms so characteristic of pneumonia are in part due to its presence. Much of the pain usually attributed to

FIG. 1.—Section of a normal diaphragm, showing a vein and artery in the center. The large white bands represent the perimysium. The finer white network represents the endomysium, separating individual muscle fibers. The small black dots are sarcolemma nuclei.

the associated pleurisy is due to movements of the inflamed diaphragm, as is the so-called pleuritic stitch, which is intensified on deep inspiration or coughing. Inflammation of the diaphragm may follow an inflammatory process, either in the chest or abdomen. In two of the writer's cases the inflammatory process extended to the

pericardium, and from thence to the portion of the diaphragm in contact with that structure.

The blood-supply of the diaphragm is from the thoracic and abdominal aorta; it receives nerve fibers both of the medullated and non-medullated variety, and it is particularly rich in lymphatics. Longitudinal sections show the transverse striations of the muscle fiber plainly (Fig. 1). The muscle nuclei, while not in excess, are fairly distributed; they are oval, or hyphen-shaped, and are usually placed parallel to the long axis of the fibers. Much connective tissue is visible, the diaphragm preserving to a certain

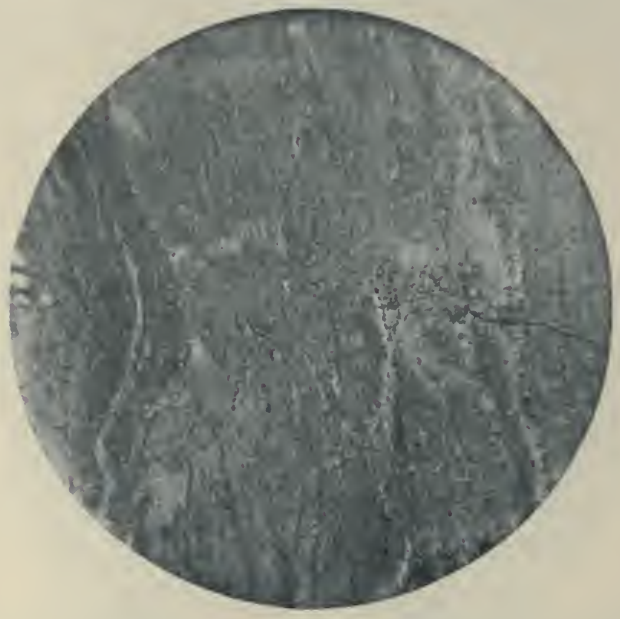


FIG. 2.—Section of inflamed diaphragm. The dark bands consist entirely of pus cells, showing how bacteria are transported from the pleural to the peritoneal surface of the diaphragm. Many of the muscle fibers are separated by masses of neutrophilic leucocytes, and there are also local collections of pus. Magnification the same as in Fig. 1.

extent its embryonic structure. The peritoneal coverings present the appearance of serous membranes elsewhere. On cross-section the individual fibers are indirectly polygonal or triangular, and the connective tissue framework stands out in bold relief.

The gross appearance of the inflamed diaphragm shows it thickened, pale, with alternate light and dark areas, due to the presence of inflammatory products between the muscle bundles (Fig. 2). If the process is mild, no gross alteration can be observed.

Microscopically, the principal features are the engorged vessels, the cellular exudate, and hyaline degeneration. The blood-vessels are distended, contain many leucocytes, and the perivascular tissue is infiltrated with cells. The intermuscular septa are thickened,

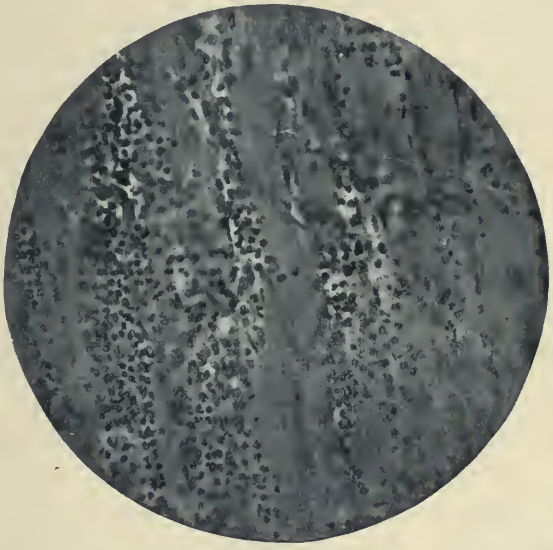


FIG. 3.—Section of inflamed diaphragm under a higher power. This shows the characteristic irregular contour of the so-called polymorphonuclear leucocyte or pus cells. These cells occupy the lymph spaces between the muscle fibers. These fibers with their transverse striæ and sarcolemma nuclei are well shown. The picture presents a typical example of purulent inflammation.

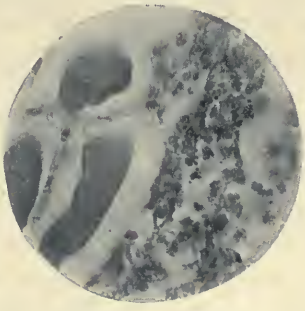


FIG. 4.—This photograph shows a collection of pus cells in the lymph spaces between the muscle fibers. Careful examination will show a number of fine black dots usually included in the protoplasm of the leucocytes. These are pneumococci stained by Weigert's method.

infiltrated with pus cells, and contain an increased number of connective tissue nuclei (Fig. 3). The polymorphonuclear leucocytes become more numerous near the surface, and just beneath the

muscle sheaths they form a distinct loop or band. This is suggestive of a perivascular leucocytic invasion, the numbers escaping from the vessels being in the minority. This especially applies to those cases in which the lower lobe is the site of the pneumonic process. The muscle fibers are swollen, have lost in part their striations, and present a distinctly hyaline aspect. Some of the nuclei are fragmented, some are granular and indistinct, while others stain darkly (Fig. 4).

In pneumonia the inflammation reaches the diaphragm sometimes by direct extension, or by the lymphatics, or blood channels. The inflammation of the muscle is sometimes remote from the lung, due to these different modes of transmission. When the pneumonic process occurs in the middle or upper lobe the inflammation extends to the diaphragm by way of the lymphatics. It is probable that direct transmission of the inflammation by way of the blood-vessels is rare, and only occurs where there is a general septic process.

The Mosquito Work in Havana.—GORGAS, W. C. *Medical Record*, vol. lxii, No. 3, p. 81, July 19, 1902.

The remarkable confirmatory results of the mosquito transmission of yellow fever in Havana makes this article of interest, dealing as it does with the method by which the mosquitoes have been exterminated. During the last ten years there has been an average of 462 deaths annually from yellow fever in Havana. In the twelve months just preceding the active propaganda against mosquitoes there were 301 deaths. When the mosquito brigades began their work in April, 1901, there was an immediate cessation of yellow fever, and only five sporadic cases occurred during the hot months of last year. There has been a marked diminution in malaria, due to the extensive destruction of the Anopheles mosquito, though primarily the work of the sanitary department of Havana has been directed toward the destruction of the stegomyia mosquito. With the idea of destroying all the mosquitoes possible, a brigade was organized to work within the houses. The stegomyia breeds principally in the yards of the more thickly populated portions of the city, in all fresh water collections such as rain-water barrels, which are numerous. Early in the season an ordinance was issued directing that every collection of water in the city be kept mosquito-proof. The city was divided into sections, to each of which was assigned an inspector and two laborers. Kerosene oil was poured into all drains, privies, and cesspools. In cases

where the people were poor, the water barrel was covered and a spigot put in the bottom at the expense of the municipality. Experience has taught that when mosquitoes are troublesome in a house, they are almost invariably bred in that house, or in the neighborhood. The stegomyia is domestic in its habits, and seldom leaves the immediate neighborhood of its birth. The effect of the work was shown in the thickly inhabited part of the city by a great decrease in the number of mosquitoes. They were estimated to have fallen to less than one-tenth. When the work was first commenced, the larvæ were reported to have been found upon 26,000 different premises. At the last inspection over the same ground they were found on only 200 premises.

Havana is a compactly built city, having gardens which are irrigated and come directly up to the city. At one time as many as 150 men were at work in these gardens cleaning the irrigating ditches. This was found to be a favorite breeding ground for Anopheles, particularly in such lands as were used for grazing purposes. Oil was not efficient, and it was found better to drain these wet soils.

In the prevention of yellow fever, every effort was made to prevent the mosquito being infected by the yellow fever patient. As soon as a case of yellow fever was reported, the room occupied by the patient was properly screened and a guard placed at the door to see that it was kept closed. Three fumigating brigades of thirteen men each were sent to the house, and as soon as the patient was screened they went to work killing mosquitoes. The screening was generally completed within two hours after the case was reported. Each room in the house, outside of the one occupied by the patient, was closed and pyrethrum was burned, one pound to every 1000 cubic feet of air space. As soon as the patient had recovered or died, the room was gone over in the same way, and the infected mosquitoes were killed before the screens were taken down. In this work there have been employed an average of about forty men, and $7000 has been spent. This has resulted in the extermination of yellow fever and a marked diminution in malaria.

Synchronous Bilateral Traumatic Pulmonary Hemorrhage.—REED, R. H. *Western Medical Review*, vol. vii, No. 7, p. 212, July 15, 1902.

It is stated that unilateral pulmonary hemorrhage, the result of traumatism, is not infrequent. This is the first case that has come under the writer's observation in which the hemorrhage was on both sides. The patient was an Italian aged 48, who was employed

in heavy work upon the railroad. While lifting, he sustained what was thought to be a slight strain of the chest and shoulders. Later, however, he developed severe shock. As there was no external evidence of injury and no hemoptysis, it was thought that he would soon recover. Such not being the case, he was taken to the hospital, where he was admitted three days after the injury.

The examination revealed no deformity or evidence of external injury. There was no temperature nor alteration of the pulse. The respirations were rapid and labored. There was dulness over the central portion of both lungs, which gradually diminished as the periphery was approached. There was absence of respiratory murmur in the central portion of both lungs. The patient's condition gradually grew worse, and he finally died five days after admission to the hospital and eight after the injury.

The post-mortem examination showed a bilateral interstitial pulmonary hemorrhage. There were signs of old pleuropneumonia, the adhesions from which had involved the pleura extensively. There was no evidence of tuberculosis or acute inflammation. The hemorrhage was confined to the central portions of the lungs and did not involve the bronchi. From the central focus the hemorrhage gradually extended in all directions, closing up the air vessels and smaller bronchi by pressure. The central portion of the right lung was heavier than water. The peripheral portion of the lung tissue seemed to be quite normal. There was considerable atheroma of the blood-vessels of the heart, brain, and abdominal viscera. In the opinion of the writer the defective pulmonary arteries were ruptured by the strain, and there was an extravasation of blood. The most interesting point in the case is the bilateral situation of the infarct, involving as it did a rupture of the blood-vessels of both lungs, at nearly the same place. In addition, the hemorrhage continued for eight days with no discharge of the blood externally and without the development of inflammation or temperature.

The Tuberculin Test as an Aid in the Diagnosis of Addison's Disease.—REULING, ROBERT C. *Maryland Medical Journal*, vol. xlv, No. 7, p. 299, July, 1902.

The patient who forms the subject of this report came under observation ten months after an illness which was of gradual development. The patient lost weight, falling from 172 pounds to 116. During the last three weeks there had been constant abdominal pains. During these attacks there was nausea and vomiting. There

was general muscular soreness, especially in the calves of the legs. Six months before being seen he noticed that his skin was very dark. There was slight morning cough, but no hemoptysis. The appetite was good, and at no time was there diarrhea.

The patient was put upon dry extract of suprarenal glands, which was not noted to alter the character of the pulse. After its use for a few days the patient became restless, complaining of severe headache, and on one occasion was slightly delirious. For the first eighteen days after his admission to the hospital there was fever, the average daily temperature being 101°, with a maximum rise of 102.3°. The temperature, as a rule, was remittent. Excepting for the febrile period following the use of tuberculin, the temperature was practically normal from the eighteenth day after admission until the patient's dismissal, a period of forty-five days. The tuberculin injection was given at the end of forty-eight hours, when there had been no rise of temperature, the latter having been taken every two hours. At 10 P.M. he was given a one-half-per-cent solution of tuberculin obtained from Dr. Trudeau's laboratory. Six hours after the injection the temperature rose one degree; at the eighth hour it had reached 101.5°, and at the tenth hour 104.7°. The following day the patient's condition was improved, and from that time until his discharge, nearly two months later, there was a continued improvement in the man's weight, strength, and in the blood count, as well as in the hemoglobin estimate.

Parasitology of Malignant Growths.—ADAMI, J. G. *Clinical Journal*, vol. xx, No. 9, p. 141, June 18, 1902.

Dr. Adami in a discussion upon cancer, its origin, nature, and general principles of treatment, before the Chelsea Clinical Society, expressed strong doubt as to the parasitic nature of malignant growths. The bodies found by Gaylord and Plimmer are degenerative products long since shown to exist in tumors. In the absence of definite discoveries, he doubts the permanent presence of microparasites in malignant growths. Deciduoma malignum shows that an alteration in cell properties may be possible by which cells assume a parasitic habit; it may be possible that this is at the bottom of malignancy. We have still to determine what initiates this property, but it must be recognized and taken as a basis for future advances. The form of tumor known as the syncytioma malignum is composed of infiltrating cells derived from another organism. The infiltrative and invasive property of these cells is not a new acquirement, but is an exaltation of properties normally

possessed by them. The development of syncytioma malignum must be attributed either to an increase in the invasive properties in the syncytial cells, or a lessened resistance on the part of the maternal tissues, or a combination of the two. If microparasites play any part in the production of the tumor, it must be either by exalting the infiltrative powers of the one, or lowering the resistant powers of the host. Positive proof of the existence of such parasites is still wanting, and in its absence it is difficult to conceive how specific microparasites should bring about these results. The prevalent conception of cancer parasite, as existing in the cancer cells, involves the idea of malignant growths being the product of parasites acting within parasites.

Blood-pressure in Mental Diseases.—ALEXANDER, H. DE M. *Lancet*, vol. clxiii, No. 1 of vol. ii, p. 18, July 5, 1902.

The writer presents some interesting data in reference to the blood-pressure in certain forms of mental disease. In his work he used the sphygmometer of Hill and Barnard. The readings were taken morning and evening at a fixed hour. The normal blood-pressure was regarded as ranging from 110 to 120 millimeters of mercury.

Melancholia is divided into four varieties: simple, acute passive, acute demonstrative, and chronic. The blood-pressure is not augmented in the simple form, but in the acute passive type it is invariably high, and remains so until the acute physical and mental symptoms abate. The high blood-pressure in the acute passive type of melancholia is thought to be due to the retention in the system of waste products. The acute demonstrative melancholia resembles mania in the fact that there is not that retention of the excretions that there is in the acute passive type of melancholia. In this form the blood-pressure is not increased in the majority of cases. In the few cases in which it was present there was not the same marked amelioration of the mental symptoms after a liquid diet and elimination. In chronic melancholia it was generally low; an elevation occurred when the mental symptoms were more acute.

In mania, Craig found the average blood-pressure in thirty-three cases from 105 to 110 millimeters. The writer has studied the pressure in sixteen cases, and has invariably found the reading above normal, though it never attains the height arrived at in acute melancholia. General paralysis presented a great variety of readings, no constant alteration in the arterial pressure being noted until after the patients became demented.

The Contraction of the Iliopsoas Muscle as an Aid in the Diagnosis of the Contents of the Iliac Fossa.—MELTZER, S. J. *New York Medical Journal*, vol. lxxvi, No. 3, p. 100, July 19, 1902.

The writer has studied systematically the help derived in palpating the abdomen by a thickening of the psoas muscle. This method can be employed satisfactorily as an aid to diagnosis in palpation of the structures situated in the iliac fossa. During active flexion of the thigh the palpating fingers perceive an elevation running diagonally across the iliac fossa in the groove between the inferior spine and the iliopectineal eminence, to the angle formed by the last rib and the first lumbar vertebra. The elevation is prismatic and its sides slope gradually. Although the psoas muscle borders on the brim of the pelvis, there is always a palpable space left between the top of the elevation and the brim of the pelvis. The appendix, cæcum, and part of the ascending colon and a portion of the ileum rest on the iliopsoas muscle on the right side, and the sigmoid flexure and a part of the descending colon on the left side.

The elevation of these viscera brings them near the surface and thus aids in palpating. The outlines are often more distinctly ascertainable than under the usual palpation. In contracting the thigh there is often a relaxation of the abdominal muscles. By alternately abducting and adducting the thigh while it is flexed, the psoas elevation moves from side to side and assists the palpation. In employing the method the patient should flex the thigh while the leg is extended.

Pneumococcic Arthritis.—HERRICK, J. B. *American Journal of the Medical Sciences*, vol. cxxiv, No. 1, p. 12, July, 1902.

The pneumococcus is not limited to the production of acute croupous pneumonia. It may have its primary localization in the meninges, middle ear, or valves of the heart. Joint complications in a pneumococcus infection are most frequent after croupous pneumonia, and may occur as late as three weeks after the crisis. Infection may be primarily in the joints, and severe and even fatal constitutional symptoms may result, without the appearance of pulmonary localization. Previous damage to a joint without rheumatism or gout favors the localization. The lesions may be limited to the synovia, or may involve the cartilages and bone. In subacute cases there may be a rapid destruction of the joint, and the same is true of some of the acute cases. The lesions are usually monarticular, the larger joints being oftenest involved. The ordinary signs

are those of an acute or chronic inflammation of the joint. Exploratory aspiration and examination of the fluid is the only means of recognizing the pneumococcic nature of the inflammation. Gonorrheal arthritis and polyarthritis have to be carefully excluded, as well as the arthralgias following pneumonia. There is a mortality of 65 per cent, largely because of the associated involvement of the meninges, pleura, and pericardium. Suppurative pneumonic arthritis should be treated by immediate incision. A serous arthritis may often be healed by aspiration, rest, and compression.

A New Method of Staining Malarial Parasites.—CRAIG, C. F. *New York Medical Journal*, vol. lxxvi, No. 11, p. 451, Sept. 13, 1902.

It is claimed that the suggested method will prove of value in recognizing the presence of the parasite, but is also of value in studying its finer structures. Two solutions are employed:

1. Saturated aqueous solution of methyl violet (G. Grubler & Co., Leipzig). This solution is prepared with distilled water, and should be at least three weeks old.

2. A five-per-cent solution of eosin (G. Grubler & Co., Leipzig).

In employing the stain, very thin blood smears are made which are hardened in absolute alcohol for five or ten minutes. They are next carefully dried and stained with solution No. 1 for ten seconds; then thoroughly washed in water and stained with solution No. 2 for from three to five seconds. They are then dried and mounted in Canada balsam. This stain differentiates the finer structures of the microörganism, one of its most valuable features being a distinctive coloring of the infected red cells. This is especially valuable in the case of the estivo-autumnal parasite, which is small and easily overlooked.

Tetanus and Vaccination.—MCFARLAND, JOSEPH. *Lancet*, No. 11 of vol. ii, vol. cxliii, p. 1130, Sept. 13, 1902.

An analytical study of ninety-five cases of tetanus following vaccination, largely based upon the numerous cases observed in Cleveland, Ohio, and Camden, New Jersey, are given. Tetanus is not a recognized complication of vaccination, but some of the standard text-books refer to the possibility. Writers on vaccination largely ignore tetanus; in the Index Catalogue of the Surgeon-General's library only seven cases are mentioned under titles where they can be recognized. The writer has found but fourteen cases in the literature. They all occurred at remote periods in different parts of

the world, and were attributed to secondary infection of the wound. From this he concludes that tetanus has not been a frequent or important complication of vaccination, either in this or any other country. Of the ninety-five cases of tetanus following vaccination, fourteen are taken from the literature, forty are unpublished cases with complete details, and thirteen are unpublished cases with incomplete details. The remaining cases are based upon rumor. Sixty-three of these occurred in 1901.

As a result of his study the writer comes to the conclusion that tetanus is not a frequent complication of vaccination. The number of cases observed during 1901 were chiefly American, and occurred in the eastern part of the United States and Canada. A small number occurred after the use of various viruses, but an overwhelming proportion after the use of a particular virus. This leads to the view that this particular product was contaminated by the tetanus bacillus derived from manure and hay. The study teaches that there should be greater care in the preparation of vaccine virus.

Peripheral Theory of Nerve Regeneration.—FLEMING, R. A. *Lancet*, vol. clxiii, No. 2, July 12, 1902.

The writer discussed this subject before the Edinburgh Medico-Chirurgical Society. There are two theories of nerve regeneration, one of which may be called the central theory, in which it is believed that the peripheral nerve regenerates by having the central axis cylinders grow down into it. The peripheral theory is that the nerve may regenerate even when the central and peripheral ends were never united. The writer has demonstrated "neuroblastic" regeneration in the peripheral ends with rabbits, at various periods after complete division. His belief is that the central axis cylinders are not passive agents in the work of regeneration of a nerve after division. It is probable there is a combination of the central and peripheral regeneration, and that both theories have an element of truth. Neuroblastic regeneration is nature's attempt to repair the damaged nerve fibers in peripheral neuritis, and it seems to be the only possible explanation of recovery in a severe case of the disease.

The Malarial Origin of Zoster.—WINFIELD, J. M. *New York Medical Journal*, vol. lxxvi, No. 5, p. 191, Aug. 2, 1902.

In a former publication the writer has shown that in an examination of the blood of eight patients affected with zoster, four of them were found to have a malarial infection. Exclusive of the eight cases previously reported, the total number of cases examined was

twenty-five. Of these, fourteen, or about 56 per cent, gave positive evidence of paludism, the malarial parasite being found in the blood. The results of these further studies show that nearly 40 per cent of all the cases of zoster occurring in the writer's practice were associated with malaria. The writer does not assert that paludal infection is the only cause of zoster, but believes that it is one of the important agents. It is probable that other infections may have the same effect.

SURGERY.

Appendicitis.—TREVES, SIR FREDERICK. Abstract, *Medical Review*, vol. v, No. 8, p. 458, August, 1902.

Treves writes entertainingly of this affection, albeit many of our surgeons are of the opinion that the English are far behind the American standard in the treatment of this disease. He says that he has removed the appendix during the quiescent period over one thousand times, with two deaths.

Appendicitis is not a new disease, nor is there evidence that it has become more frequent. The older literature of medicine buried it under a mass of confusing names such as "gastric attack," "gastric seizure," "paratyphlitis," "cramp of the bowels," "inflammation of the intestines," "iliac phlegmon," and the like. It was the cause of many forms of peritonitis. The rapidity with which the peritoneum can isolate inflammatory effusion was not understood; consequently localized iliac abscesses were supposed to occupy the connective tissue of the iliac fossa.

Appendicitis does not exist until the peritoneum is implicated. Extensive inflammation of the appendix, thickening of its walls, ulceration, and even some stenosis, may exist without symptoms. There may be irregular attacks of acute appendicitis dependent upon changes which do not implicate the peritoneum. In these cases there may be occasional sharp pain in the iliac region which for a moment may make the patient feel sick and faint, and the peculiarly sensitive may vomit. There is no pyrexia, nor notable tympanites. On several occasions the writer removed an appendix where there had never been a definite attack of appendicitis, though there was revealed a degree of inflammation and ulceration of the organ greater than where there had been definite attacks of the accepted type.

In a series of cases there may be abiding trouble in the right iliac

fossa which may present occasional exacerbations; such a condition merits the term chronic appendicitis. The symptoms are due to gross changes which have never invaded in an abrupt manner the peritoneum, and hence there has never been an "attack of appendicitis." Such patients are never well, they are subject to unending digestive disturbances, colics, constipations, and occasional severe pains. There is a sense of weight or dragging pain in the right thigh, and a disposition to walk with the body bent. There may be no pyrexia. The condition of the appendix varies; in some cases it is full of pus, and in others contains concretions, or is thickened and ulcerated.

Eighty per cent of the cases of appendicitis occur in patients under 30, and 73 per cent of the whole number are in men. In women an attack frequently coincides with the menstrual period, and there is a close relation between the lymphatics of the right ovary and that of the appendix. In some cases in which the appendix has been removed for recurring appendicitis, the symptoms continued after the operation, being due to chronic ovaritis. The most frequent cause of appendicitis is a loaded cæcum. In many cases attacks of exceptional constipation have preceded the outbreak, and many patients learn that so long as they keep their bowels in order they have little to fear. Lodgment of ill-digested food in the cæcum is the most common preliminary to an attack.

McBurney's point is of no special diagnostic significance. Tenderness in the right iliac fossa is a conspicuous symptom of appendicitis, and as this point is the center of the fossa, it may be the center of the tender area. It does not indicate either the starting-point, or even the chief point of the disease. It does not indicate the situation of the diseased appendix, nor does it even correspond with the base of the appendix. Tenderness at this point is common in healthy persons, and in colitis involving the cæcum such tenderness may be acute.

It seemed to the writer desirable to ascertain: (1) What structures are under the spinoumbilical line; (2) what differences, if any, the two iliac fossæ present; (3) what structures are under the spot known as McBurney's point, or Munro's point; (4) why in healthy individuals tenderness is so common at a certain spot in the right iliac fossa and is not found in the left.

Dr. Arthur Keith investigated these points, and comes to the following conclusions:

1. The spinoumbilical line runs from the anterior superior iliac

spine to the navel. The point at which it crosses the outer edge of the rectus is called "Munro's point" (Merkel). This line in the young male adult measures about six inches, and Munro's point is on an average about 2.6 inches from the iliac spine. The structures which lie below the line are shown in Fig. 1, which represents a section made in the plane of the line in a female subject aged 55, hardened by formalin. The ureter crosses the spinoumbilical line at the point of junction of its inner and middle thirds. The genito-crural nerve is close to it. The relations are the same on the two

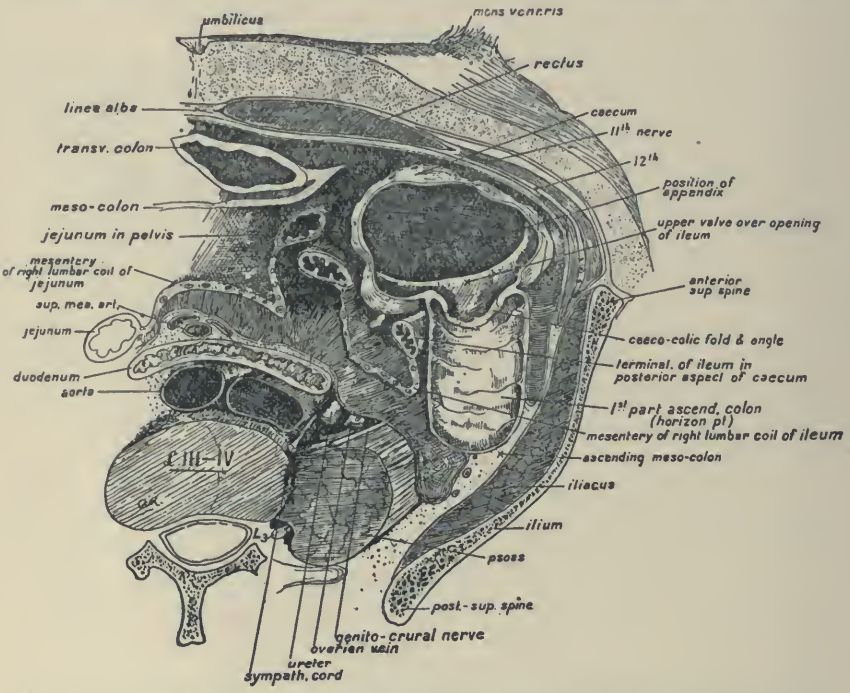


FIG. 1.—Oblique transverse section of female subject through anterior superior spine, umbilicus, and disk, between third and fourth lumbar vertebræ.

sides. The eleventh dorsal nerve enters the sheath of the rectus beneath Munro's point. The skin between the iliac spine and Munro's point is supplied mainly by the lateral cutaneous branch of the eleventh dorsal. Munro's point nearly corresponds to McBurney's point, but has the advantage of more precise localization.

2. The two iliac fossæ present the only anatomical difference that the cæcum is in one and the sigmoid flexure in the other.

3. The structure peculiar to the right side, which comes more or

less precisely under McBurney's or Munro's point, is the ileocæcal valve (Fig. 2). In twenty-two instances the valve was situated under or near Munro's point, in fourteen above and external to it,

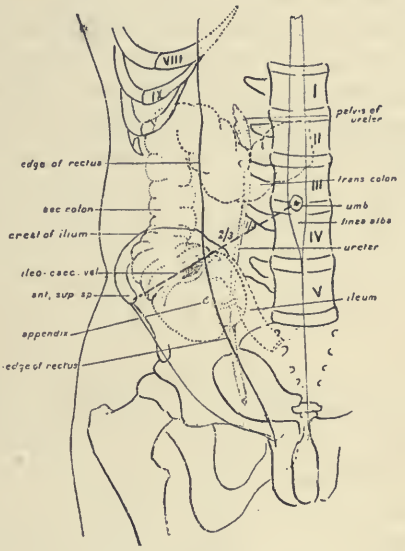


FIG. 2.—The average position of the ileocæcal valve, cæcum, and appendix on spinoumbilical line.

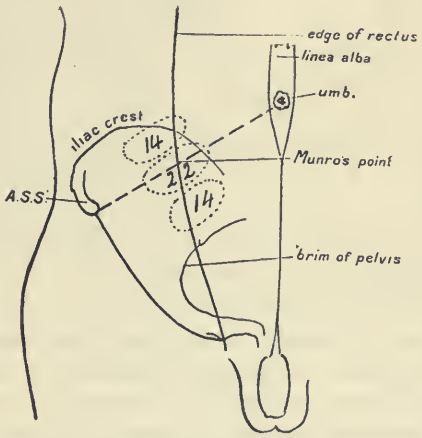


FIG. 3.—Shows diagrammatically the position of the ileocæcal valve in 50 subjects. (Hardened by formalin.)

and in fourteen below and internal to it (Fig. 3). The base or opening of the appendix lies on an average rather more than one inch below the opening of the ileum.

4. The tender spot, which can be made out in so large a proportion of healthy individuals, seems to correspond to the ileocæcal valve. The tenderness is well defined, is elicited by deep pressure with one finger, and is represented by no corresponding sensitiveness on the left side. It will be found about the spinoumbilical line, and in close proximity to the two "points" mentioned. Of twenty-seven healthy medical students Dr. Keith found this sensitive area situated beneath the line and near to the rectus edge in eleven, above the line in nine, and below it in four. In three no special sensitive spot could be made out on deep pressure (Fig. 4). The nerve-supply of the ileocæcal valve is through the eleventh or

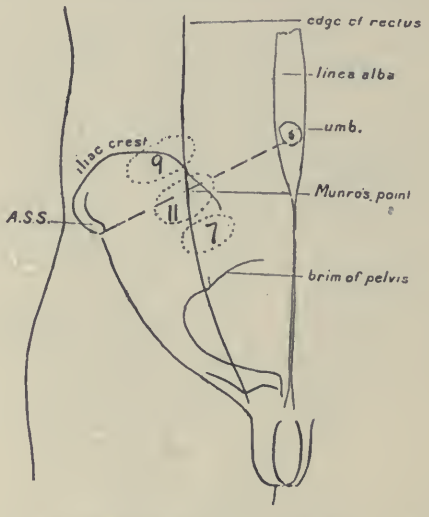


FIG. 4.—The position of tenderness elicited by deep pressure in the right iliac fossa in 27 students. In the lower group are included three students in whom no special tender spot could be found.

twelfth dorsal nerves, or through both. The innervation, like that of most orifices, probably is elaborate.

In discussing the question of operation, the writer says the greater proportion of cases of appendicitis terminate spontaneously in recovery. Probably the general mortality of the disease is not above five per cent. Operations during an acute attack are attended with considerable danger, which is probably expressed by a mortality of over 20 per cent. The removal of the appendix during the quiescent period is attended with little risk, the mortality being as low as .02 per cent. The pathology of the disease and its general mortality do not sanction opening the abdomen in every case of appendicitis as soon as the diagnosis is made. Immediate

operation is demanded in all ultra-acute cases and in those very hopeless cases which present from the outset the phenomena of intense infection, and in which it is evident that a large dose of poison has suddenly been introduced into the system. In the same category are also included cases in which the symptoms resemble in acuteness those of perforated gastric ulcer. Immediate operation is demanded in every case in which there is a reasonable suspicion that suppuration has taken place. In other cases the question of operation may remain in abeyance after the first few days, usually until the fifth day, or after.

Stress is laid upon the fact that the great majority of cases of appendicitis recover spontaneously without either an operation or the formation of an abscess, that the grave cases are rare, and that suppuration is uncommon.

Operative Treatment of Ascites Due to Cirrhosis of the Liver.—PETERS, GEO. A. *Canadian Journal of Medicine and Surgery*, vol. xii, No. 3, p. 153, September, 1902.

The hopelessness of cirrhosis complicated with ascites justifies a resort to surgical measures even if the result is somewhat problematical. A large series of cases shows that life lasts on the average sixty-three days after ascites develops in this disease. The operative mortality in attempting to establish the collateral circulation is shown in twenty-two cases to be between 23 and 7 per cent, and the recoveries 41 to 64 per cent. In all, only about one-third of the cases of cirrhosis of the liver are accompanied by ascites. It is believed that in those cases in which this symptom is not present there is early established a collateral circulation. This circulation in the majority of cases is not a new development of vessels through the formation of adhesions, but is a dilatation and amplification of the normal communications.

The writer reports two cases in which the operation of Talma, somewhat modified, was carried out. In the first case the turgid condition of the blood-vessels of the liver was such that it led him to think that if an extensive scrubbing of the surface of the organ was undertaken it might lead to dangerous oozing. The patient was rapidly approaching a fatal issue. At the time of the report, eleven months after the operation, he was in fair general health. The patient was 46 years of age, and had been a moderate drinker. The ascites appeared in February, 1901, after a mild attack of grippe. The fluid in the abdomen increased with great rapidity, accompanied with shortness of breath and palpitation. He was

tapped several times. At the time of operation the legs were edematous. There was no albumin in the urine.

The incision, four or five inches long, was made in the median line above the umbilicus, care being taken to keep a trifle to the left. A high incision such as here recommended will empty the peritoneal cavity of its fluid sufficiently, and it is not necessary to make a counter-opening lower down. In the operation of fastening

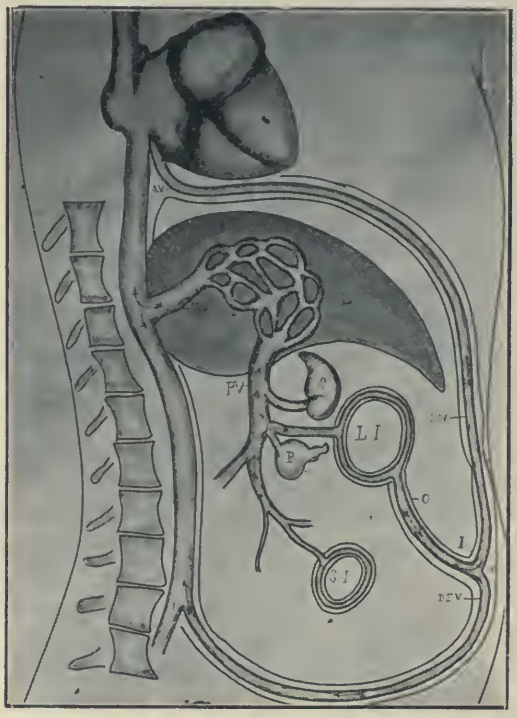


FIG. 1. — Diagrammatic scheme to show the collateral circulation the operation seeks to establish. The arrows show the direction of the current. The viscera drained by the portal vein are sufficiently indicated by the letters on the diagram. *I*, the point of implantation of the omentum into the abdominal wall (this should have been shown above the umbilicus). The veins from the omentum (*O.*) empty (1) into the intercostal veins (*I. C. V.*), which reach the superior vena cava through the azygos veins (*A. V.*), and (2) into the deep epigastric and lumbar veins (*D. E. V.*), which empty into the inferior vena cava through the lumbar, iliolumbar, and common iliac veins, thus avoiding the obstructed passage through the liver.

the omentum to the abdominal wall the procedure recommended by Talma was modified. Avoiding the suspensory ligament of the liver, a longitudinal incision about 1.5 inches in length was made through the parietal peritoneum and subparietal tissue with the handle of the scalpel, or a pair of blunt-pointed scissors. A flap consisting of peritoneum and subparietal areolar tissue was raised,

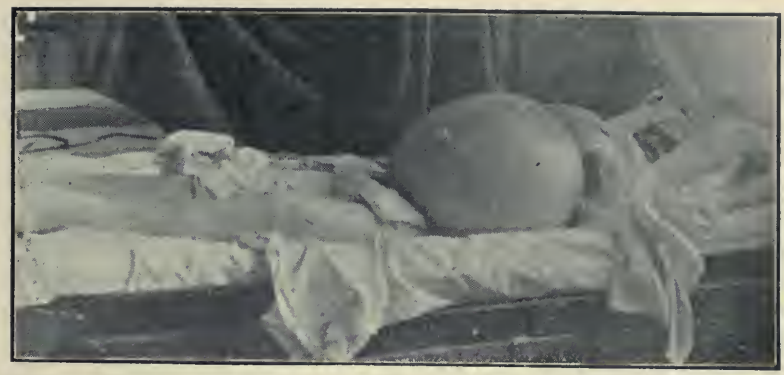


FIG. 2.—Showing great distention of abdomen before operation. Girth, 64 inches. Note also the edema of the feet and legs.

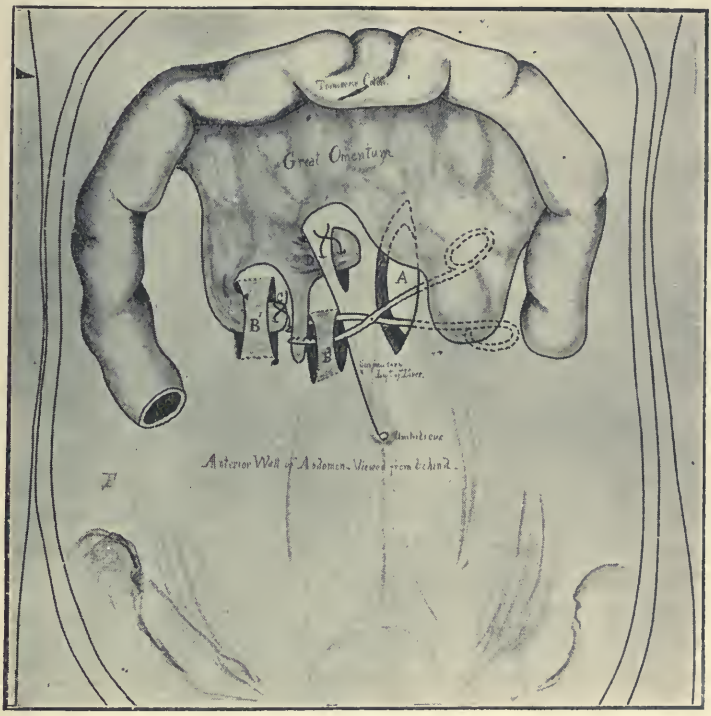


FIG. 3.—Diagram to indicate the method of implanting the omentum. The diagram represents the anterior wall of the abdomen, the transverse colon, suspensory ligament of the liver, and the omentum as seen from behind or within the abdomen. *A*, the incision in the anterior wall of the abdomen above the umbilicus. B^1, B^2, the strips of peritoneum raised to allow of portions of the omentum being drawn through. *C*, the implanted omentum stitched into position by a catgut suture. *D*, large graft into the suspensory ligament of the liver.

and the peritoneum again cut through in a longitudinal direction about 1.5 inches from the first incision. In this way a strip of peritoneum attached at both ends was raised (Fig. 3, B^1 and B^2); a pair of long-handled forceps was passed under this strip, and a portion of the omentum was seized and drawn under the strip of peritoneum and fastened by a single catgut suture. This process was repeated at a point somewhat nearer the margin of the wound on the right side, and again in two or three places on the left side. In addition to this, a large graft was made into the suspensory ligament of the liver (Fig. 3, D), a longitudinal incision was made in the ligament, and a portion of the omentum was drawn through this slit and stitched in place. The abdominal wound was then closed without drainage. Tapping in this case was necessary after the operation, but by the middle of November the fluid ceased to accumulate.

Case two was somewhat similar in its clinical history, but the results, as the report is made only twenty-one days after operation cannot be stated.

Surgical Features of Typhoid Fever.—McCrae, Thomas, and Mitchell, James F. *American Medicine*, vol. iv, Nos. 10 and 11, pp. 373 and 409, Sept. 6 and 13, 1902.

The writers give a summary of the cases of typhoid fever presenting surgical features treated in the Johns Hopkins Hospital from June, 1900, to June, 1902. The cases were under the joint care of the medical and surgical clinics.

In all there were treated 275 cases, of which a number presented unimportant complications such as boils and abscesses. Periostitis and perichondritis have been seen occasionally, but subsided without surgical interference. Glandular affections, especially mastitis, occurred, but were not serious. Abscess of the liver occurred once, with recovery. There were symptoms of cholecystitis in five cases, of which three subsided without operation. One patient was operated upon and recovered, while in one the gall-bladder ruptured and general peritonitis resulted. Appendicitis was suspected in three cases and developed once during the course of the fever.

In the discussion of the perforation cases, attention is called to the distinction between the symptoms of perforation and those of the resulting more or less general peritonitis. All cases with suspicious symptoms were carefully watched, but the sudden onset is the most valuable help in diagnosis. In a patient who has been having abdominal symptoms for some days perforation may mean little

change, and only the development of extensive peritonitis may be recognized. Patients with suspicious abdominal symptoms, such as pain and tenderness, perhaps associated with leucocytosis, often clear up completely. These have led the writers to attach less importance to the so-called warning symptoms and preperforative leucocytosis. It is probable that hourly counts of the leucocytes are alone of service in detecting a preperforative leucocytosis. Perforation may occur in patients whose previous condition has not indicated the necessity of such counts. In four of the eight cases of perforation there were no abdominal features. Of these eight cases, seven were operated on, with two recoveries. All seven were recognized within nine hours except two, in which hemorrhage from the bowel accompanied the perforation. In one case operation was not advised, because the patient was moribund. Exploratory laparotomy was done in two cases in which no perforation was found. In one the symptoms proved to be due to intestinal hemorrhage, and in the other to a low grade of peritonitis. Eleven patients with suspicious abdominal symptoms were not operated upon; of these two died, and the autopsies showed no perforations. The remaining nine recovered.

The Surgical Treatment of Chronic Bright's Disease.—SCHMITT, J. A. *Medical Record*, vol. lxii, No. 11, p. 405, Sept. 13, 1902.

The writer gives a summary of the recently published cases of surgical treatment of Bright's disease. In acute infectious diseases, anuria with uremic symptoms threatening life can be successfully combated by capsular incision or renal cleavage. The effect of this operation is to relieve congestion and internal pressure. Operation on one side is sufficient to restore an abundant urinary secretion. Anuria with uremic symptoms occurring in the course of chronic Bright's disease has been made the subject of occasional surgical intervention. Temporary relief in some instances was secured; a permanent cure has never been effected. When the kidney has been operated on directly for the cure of chronic Bright's disease, the outcome has been a failure. The apparent benefit manifested in the disappearance of dropsy, dyspnea, etc., occurs quite as regularly in the ordinary course of medical treatment. In exceptional cases colicky pains and hematuria are caused by chronic Bright's disease. Capsular incision, or cleavage of the kidney to which the disturbances are traceable, has been attended by excellent results. Surgical intervention has succeeded in checking the hemorrhages and alleviating the pains, but it does not inhibit the progress of chronic

Bright's disease. Nephropexy may cure elements incident to movable kidney, and may remove albuminuria if this be the result of local irritation consequent upon displacement. If, however, the movable kidney is affected by chronic Bright's disease, this disorder is uninfluenced by the operation.

A New Method of Passing the Suture in Fixation of the Kidney.—BRÖDEL, MAX. *American Medicine*, vol. iv, No. 5, p. 176, Aug. 2, 1902.

The consistence of the kidney is such that it is difficult to make sutures hold. The simple through-and-through suture frequently

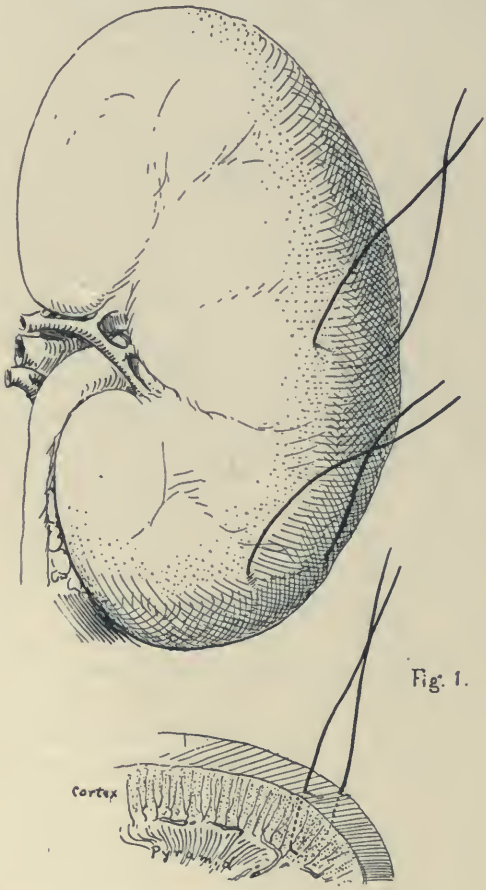


Fig. 1.

tears out while being tied, or later. The insecurity of such sutures is due to their passing in the same plane as the cortex. The suture devised by the writer is introduced at right angles to the cortex, the

design being to have the capsule of the kidney furnish the main support, as this is the most resisting structure.

The suture is passed triangularly through the kidney, as is shown in Fig. 2. The strength of this suture lies in the fact that tension makes pressure from without inward, so that the suture,

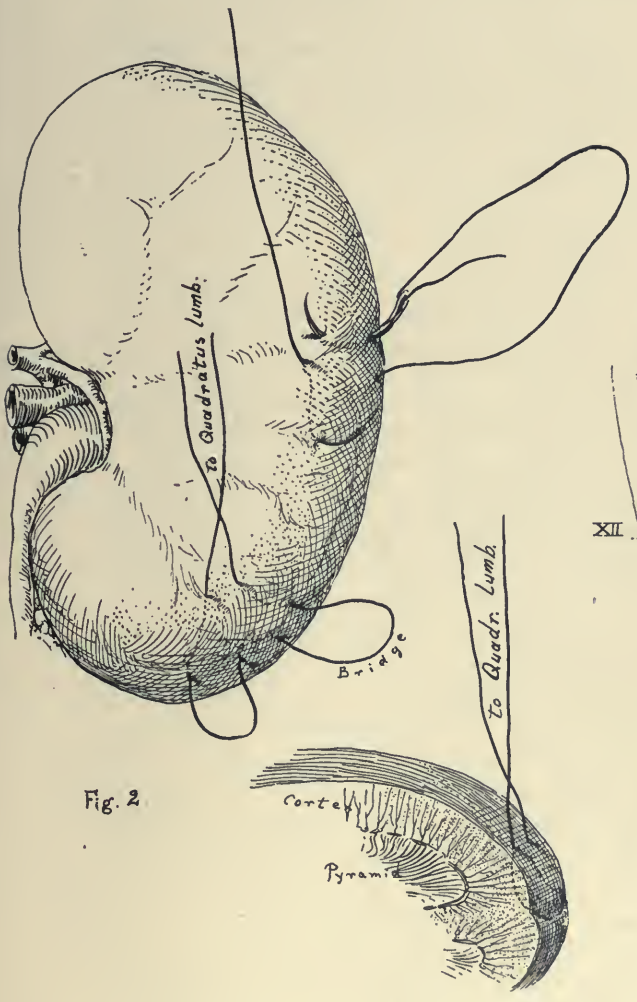


Fig. 2

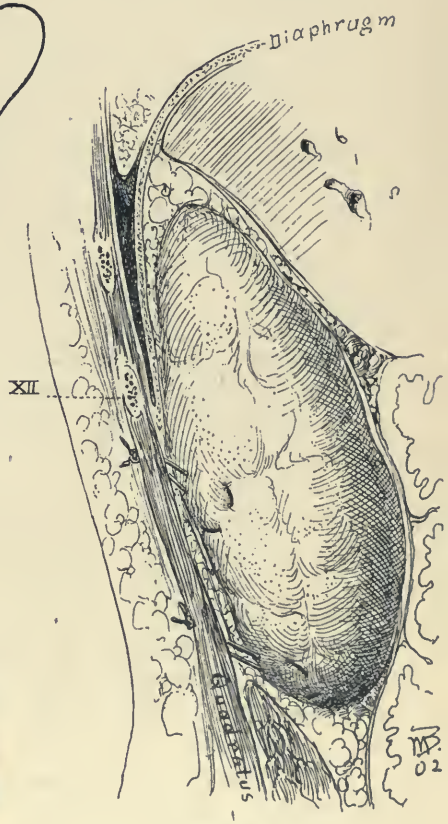


Fig. 3.

instead of having its bearing on the friable cortical substance of the kidney, makes pressure upon the capsule. The bearing surface of the suture which the writer speaks of as the bridge should not be shorter than seven millimeters. Two bridges of seven millimeters

each are stronger than one of fourteen millimeters. The sutures are best placed so that the bridges run along or across the depressions between the lobules of the kidney, as the capsule is firmest along these lines. The suture should not be carried below the cortex. The apex of the triangle (Fig. 3) should be on top and the bridges below, so as to place the suture in the best position to counteract the forces tending to bring the kidney to a lower level. Two sutures are sufficient to hold a kidney and keep it securely fastened: one as near as practicable to the lower pole, and the other as high up as the position of the pleural reflection will permit.

THERAPEUTICS.

Adrenalin in Urological Practice.—V. FRISCH, A. *Wiener Klinische Wochenschrift*, 15th year, No. 31, p. 788, July 31, 1902.

The writer has found adrenalin of value in operations upon the urethra and bladder. In making a cystoscopic examination where there is vesical hemorrhage, the preliminary irrigation increases the blood in the bladder, and this so obscures the examination with the cystoscope that only a momentary view of the vesical wall can be obtained. In such cases the bladder is injected with from 100 to 150 cubic centimeters of a 1-to-10,000 adrenalin solution and the liquid allowed to remain three or four minutes. This suppresses the hemorrhage, and the cystoscopic examination is carried out with ease.

In operating on tumors of the bladder and in performing suprapubic cystotomy, adrenalin 1 to 1000 is applied to the mucous membrane of the bladder. This at once blanches the tissue and leaves a clear field for operation. As the anemia of the mucous membrane persists for but a short time, it is well to pack the wound so as to provide for drainage in case there should be a secondary hemorrhage.

In narrow strictures which are permeated with difficulty, the constricting effect of the adrenalin upon the swollen mucous membrane greatly facilitates the introduction of a sound. In introducing a catheter where the prostate is hypertrophied, a preliminary instillation of one to two cubic centimeters of adrenalin solution 1 to 1000 into the prostatic urethra is of distinct advantage. The introduction of the catheter is facilitated and there is rarely hemorrhage. Cocaine has been employed for the same purpose, but the

anemia produced by this drug is not so pronounced, nor does it persist so long as that caused by adrenalin.

The writer has used the solution in three cases of acute complete suppression of the urine due to hypertrophied prostate. In all the cases the patients had been unable to void a drop of urine spontaneously. Two cubic centimeters of adrenalin 1 to 1000 was injected into the prostatic urethra, and at the end of three or four minutes the patient was able to pass a small amount of urine. This was followed by a fairly quick return of normal function, much the same as where a Bottini operation is successfully performed. The quantity of spontaneously voided urine, which in one case amounted to 500 cubic centimeters on the first day, increased faster than he has seen it in cases in which other treatment has been employed. The preparation used was that of Parke, Davis & Co.:

Adrenalin chloride	0.1
Sodium chloride	0.7
Chloretone	0.5
Distilled water	100.

Addison's Disease Cured by Suprarenal Extract.—DEEKS, W. E. *Montreal Medical Journal*, vol. xxxi, No. 7, p. 509, July, 1902.

The recent literature of medicine contains references to cases of Addison's disease cured by suprarenal extract, and, again, reports in which this substance has produced no amelioration of the disorder. Roughly estimating these reports, we should say that they were about equally balanced.

The case reported by Deeks is typical of the disorder. The patient, 32 years of age, was admitted to the hospital April 3, complaining of pain in the stomach, back, and head. Her illness began the previous November, with weakness, loss of appetite, and diarrhea, but she was able to continue her usual occupations until January. At that time the skin was becoming abnormally brown. Her previous history was negative excepting an attack of malaria seven years before. She is married and has six healthy children. On admission to the hospital the respirations were 24 and temperature 102°. There was breathlessness, dizziness, headache, and palpitation, with marked lassitude. Speech was slow and incoherent. The pigmentation was universal, but deeper on those parts where pigment normally is present. It was also found on the mucous membrane of the lips and cheeks. The extremities were cold and clammy, and she fainted on slight exertion. The stools were liquid and varied from two to nine daily. The tongue was dry, coated, and pale. There was slight dulness on percussion of the upper part

of the lung, with no râles. The sputum contained no tubercle bacilli. The blood contained 32 per cent of hemoglobin and 2,100,000 red cells, showing a marked poikilocytosis and a relative leucocytosis. The average urinary excretion was thirty ounces, containing .2 per cent albumin and no casts.

The patient was put upon a liquid diet, together with strychnine, cocaine to allay the vomiting, and hemaboloids, which treatment was continued for one month without benefit, there being a progressive enfeeblement. The treatment was then changed to suprarenal extract three times daily after meals. Improvement began immediately, and within three days the vomiting and diarrhea lessened and the patient began to gain strength. From this on the patient steadily improved, and within two weeks after beginning treatment she was comfortable. Twenty-four days after beginning the administration of the suprarenal the hemoglobin was found to be 40 per cent, and the red cells had increased to 3,850,000. At the end of a month the patient was able to leave the hospital, and two weeks later left for her home and reports herself quite well.

Report on Beriberi.—*Journal of the American Medical Association*, vol. xxxix, No. 7, p. 388. Aug. 16, 1902.

The investigations of a committee appointed by the Norwegian Scientific and Literary Society have brought out some facts regarding this singular affection that are of special interest. The committee briefly reviews the distribution and pathologic anatomy of the affection and refers to the three prevalent theories regarding its origin. One of these is to the effect that it is due to a specific microbe, another that it is a constitutional disease due to inadequate or insufficient food, especially the want of albumen and fat, and third, that it is due to an intoxication caused by chemical changes in the food.

None of these theories explain in a satisfactory manner the appearance of the disease on European sailing ships. The material gathered included the data obtained from 104 ships. The disease on Norwegian ships has appeared within the last decade, and has been especially prevalent since 1895. Norwegian, Scandinavian, and Finnish ships suffer the most, German ships come next, while the English suffer very little. Almost all the cases have appeared upon sailing vessels; but one patient has been found upon a steamer.

The general trend of opinion is that inadequate food, and especially the use of much tinned food, produces the disease. The

drinking-water is not at fault. It has appeared on ships where rice has neither been used nor been on board at all.

From a study of the data at hand the committee is of the opinion that this disorder is a multiple neuritis due to intoxication from tainted animal or vegetable food. The vegetable form closely corresponds with the Asiatic beriberi, and is usually due to the eating of tainted rice. That charged to tainted animal food gives the type of the disease noted in the European sailing ships, and is due chiefly to the eating of tinned food. The disease is distinct from scurvy, is afebrile, and is not relieved by lime juice and the ordinary prophylactics for scurvy. Fresh provisions in the form of fresh fruit and vegetables are prophylactic for the disease, and immediately relieve the symptoms after the disorder has been set up.

Hyoscine Hydrobromate in Alcoholism. — BERING, R. E. *Therapeutic Gazette*, vol. xviii, No. 8, p. 507, Aug. 15, 1902.

The case reported is that of a chronic alcoholic whose potations had increased until he was on the verge of delirium tremens. Efforts at treatment had previously been employed, but were unsuccessful. The patient at last pledged himself to remain four days under treatment. He was placed in a room which was darkened, and in the care of a competent nurse. The patient at the time was delirious.

The treatment was begun by administering hyoscine in $\frac{1}{200}$-grain doses every hour until the following morning, after which the dose was increased to $\frac{1}{100}$-grain every hour for the next day and a half. Strychnine, pilocarpine, and liquid peptonoids were then given. In all, forty-two doses of hyoscine were given, the patient being kept continually under the action of the remedy during the whole course of the treatment. Within two hours after discontinuing the hyoscine the patient came out from under the drug. At the end of four days' treatment he was able to attend to his usual duties, though somewhat weak, and the desire for alcohol had disappeared. At no time during the course of the treatment was there any bad effect upon the circulation, the pulse remaining below 90 at all times. During the entire period of hyoscine intoxication, which lasted for forty-two hours, there were hallucinations and he was delirious, and there was no sleep. At no time was food given during the administration of the hyoscine, but water was given at frequent intervals. The general effect of the treatment was to sober the patient quickly without the unpleasant effects due to the immediate withdrawal of whiskey.

Epithelioma of the Eyelid Cured by a Solution of Adrenalin.—MARPLE, W. B. *Medical Record*, vol. lxii, No. 8, p. 294, Aug. 23, 1902.

The patient was a woman 45 years of age, whose previous health had been good. In June, 1901, there was a small growth on the left lower lid which began six years before. There was at first a minute projection from the margin of the lid, which gradually extended. During the preceding winter it readily inflamed and bled easily. At the time she came under observation the border of the left lower lid presented a characteristic infiltrating epithelioma extending from the external canthus to beyond the middle of the lid, the area of the growth being 18 by 6 millimeters. A portion of the growth was excised, and upon microscopical examination showed the characteristics of an epithelioma. A solution of adrenalin was given, which she was directed to use every evening. The following December the margin of the lid which had been previously occupied by the epitheliomatous growth was clean, and all signs of the epithelioma had disappeared. The adrenalin, 1 to 1000, had been used regularly for three months. After the preparation had been used for a month it was noticed that little brown scabs or crusts formed on the outer surface of the growth, which fell off spontaneously, or by slightly rubbing. As these crusts came away the growth became smaller, until it had disappeared. The writer was much surprised by the result, as the remedy was only given for temporary relief in controlling the congestion, expecting later to excise the growth.

The Roentgen Ray in the Treatment of Sarcoma.– COLEY, W. B. *American Medicine*, vol. iv, No. 7, p. 251, Aug. 16, 1902.

Coley comes to the conclusion that the cases so far treated prove that the Roentgen ray has a remarkable inhibitory action upon the growth of all forms of malignant disease. This is so pronounced that even far-advanced and inoperable malignant growths may be removed by the *x*-rays, there being a disappearance of the tumors often without breaking down of the tissues. Whether the patients have been cured, or the disease has been merely arrested to reappear at some future day, is a question that time alone can decide.

Recent observations and experiments upon the various forms of carcinoma and sarcoma prove that an agent supposed to be of value only in a very limited class of superficial epitheliomas promises to be of as great or even greater value in practically every variety of cancer.

There is almost nothing to show that deep-seated tumors in the abdomen and pelvis can be cured or benefited by the Roentgen ray,

but there is reason to hope that with improved apparatus, or with greater knowledge and skill in using the apparatus we now have, even these cases may be benefited. The Roentgen ray has a marked influence upon the pain of nearly all malignant tumors.

The Glycerophosphates in the Treatment of Nervous Disorders.—WEST, H. A. *Merck's Archives*, vol. iv, No. 7, p. 263, July, 1902.

The writer reports eight cases in which there was marked symptomatic improvement in nervous disorders under the use of the glycerophosphates of lime and soda. The remedy has been of value in neurasthenia, melancholia, nutritional disorders, and the debility following the acute infections. The glycerophosphates were recommended in 1894 by Robin, who was led to take up the study of the salts of phosphorus by noting in the urine of certain neurasthenics imperfectly oxidized phosphates. He concluded that these had their origin in the neurolecithin, a substance found in all cells, but especially abundant in those of the nervous system.

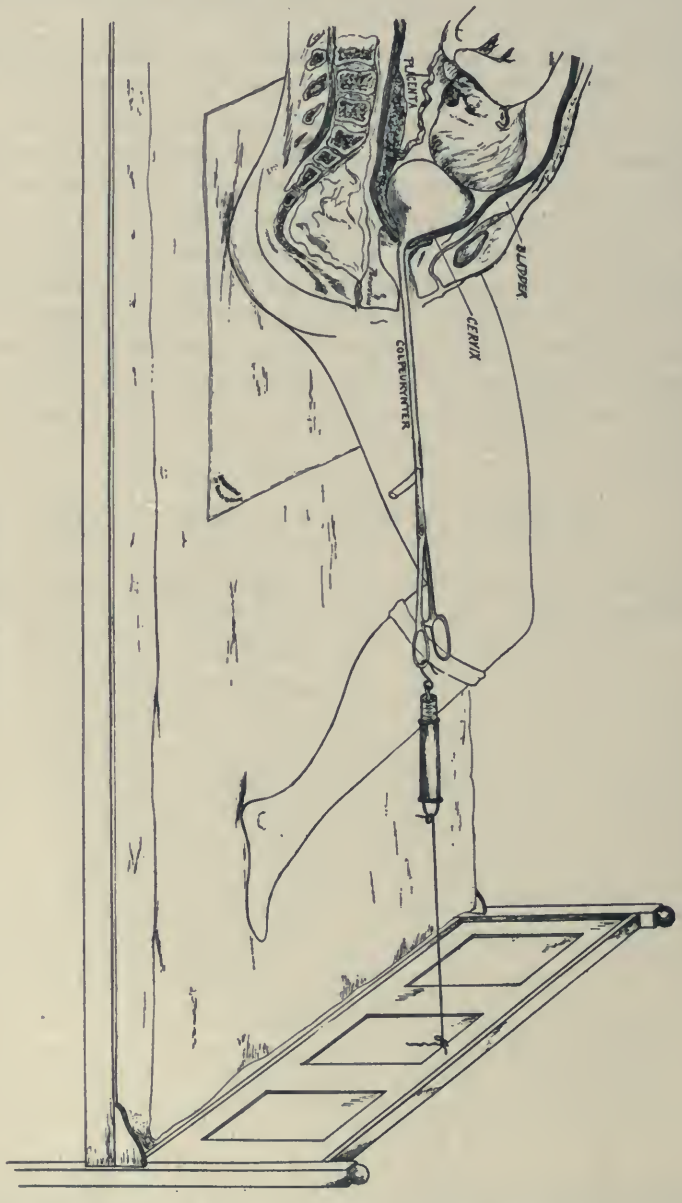
OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

The Treatment of Placenta Previa Based upon a Study of Thirty Cases.—DE LEE, J. B. *American Gynecology*, vol. i, No. 2, p. 151, 1902.

The writer disapproves of the proposal to do a Cæsarian section in all cases of placenta previa, as the hemorrhage may be no better combated than with the ordinary obstetrical procedure. The Braxton-Hicks method of version saves most of the maternal mortality, but a large percentage of children are lost. The mother should rarely die in placenta previa except where there are such complications as air embolus, or hemorrhagic diathesis. No tentative measure should be employed in previa, but labor should be induced if the child is viable. When the hemorrhage is moderate delay may be justified, providing the patient is in bed in a well appointed hospital. No one method of treatment will meet all cases, but the best results in placenta previa will be obtained by the practitioner who has least regard for the child.

The best way to induce labor is to puncture the bag of waters and introduce the colpeurynter into the uterus, resting on the placenta and pressing against the cervix, and then to put traction on the tube. Traction should not be too rapid, nor should there be too early delivery. The cervix in cases of placenta previa is altered so that it is easily distended. The placental site if rup-

tured is certain to open vessels of some size. The retractile power of the lower segment is slight, and a hemorrhage from such a laceration is often obstinate and severe.



Colpeurynter bag in use.

In the treatment with Carl Braun's colpeurynter the instrument is sterilized by boiling for twenty minutes, is rolled as compactly as

possible, and grasped by forceps, and under the guidance of the index-finger is placed inside the membranes. The bag is then slowly filled with a weak lysol solution, using from twelve to sixteen ounces. The head is pushed to one side, or directly upward. The tube is clamped with an artery forceps and traction is made on the bag. The bag acts like the breech, stops hemorrhage, excites pain, and dilates the cervix. If the case promises to take a long time, a tape may be fastened to the forceps and attached under tension to the foot of the bed. The writer prefers manual traction, relaxing the tension occasionally to allow blood to enter the cervical tissues. The tension ought not to exceed two pounds. The bag is commonly expelled in from two to eight hours.

When the bag has passed the cervix, and it is found that the head has followed, the case may be left to nature. If the cervix is not dilated completely a version may be done, or the colpeurynter replaced and distended with a larger quantity of fluid.

A New Method of Breech Extraction.—HERMAN, N. *International Journal of Surgery*, vol. xv, No. 8, p. 223, August, 1902.

The writer discusses the method of delivery by the breech and those that have heretofore been employed. The manual method described by Lusk is as follows: "The expulsion of the child may sometimes be accomplished by a graduated pressure upon the fundus of the uterus. Should this method prove ineffective, manual extraction should be attempted. To this end the index-finger should be inserted into the fold of the anterior groin, and traction may be directly downward. By seizing the wrist with the disengaged hand, an increase of traction power can be exerted. If the breech is low, both index-fingers may be employed, the one in the anterior and the other in the posterior groin, or the entire hand passed over the sacrum may seize the pelvis with the thumb in one groin and the index-finger in the other."

The method proposed by the writer is a modification of that suggested by Lusk, and the inner surface of the ischium of the child takes the place of the posterior groin. It is accomplished by crooking the index-finger in the anterior groin after the manner described, and then inserting the other index-finger well oiled into the child's rectum far enough to make counter-pressure to the finger in the groin, and making traction. There is little tendency to slip, but this is entirely obviated if one hand is used as a tractor. In this case the thumb is crooked in the anterior groin and the index-finger of the same hand inserted into the child's rectum, which gives a firm grip on the anterior buttock.

In this method it is not necessary for the breech to be so low; in fact, it can be applied as soon as the fold of the anterior groin becomes accessible to the index-finger, thus shortening the labor several hours, or possibly avoiding the use of instruments.

Treatment of Asphyxia Neonatorum.—De Lee, J. B. *International Medical Magazine*, vol. xi, No. 8, p. 449, August, 1902.

Prophylaxis plays an important part in the treatment of asphyxia. During labor the fetal heart tones should be carefully studied, especially toward the end of the second stage. The physician should be prepared to treat the accident. He should have in the obstetric case catheters for aspirating the bronchi, and if he is to do an operative delivery he should have a hot bath ready and hot towels. If danger to the child is diagnosticated *in utero*, it should be delivered as rapidly as is consistent with the safety of the mother. As soon as the child is born, the question of the degree of asphyxia is to be determined. In mild asphyxia the child is rigid, blue, with turgid lips, slight exophthalmus; its pharynx and trachea are full of mucus, so that when it gasps no air can get into the lungs. The throat reacts to the finger.

In severe asphyxia the extremities hang down, the surface is pale, the jaw falls or is jerked by an occasional gasp, the throat does not react to the finger, the heart beats faintly, or is only perceptible to the ear. These are not different forms of asphyxia, but different degrees.

The underlying principles governing the treatment of asphyxia neonatorum are: (1) maintain the body heat; (2) free the air-passages from obstruction; (3) stimulate respiration, or supply air to the lungs.

The importance of keeping up the body heat is not fully appreciated. The infant is wet, exposure is often prolonged, evaporation is rapid, and the body temperature sinks. Hence the baby should be wrapped in warm towels, or put in a warm full bath.

The air-passages must be cleared. In mild cases it is sufficient to wipe the throat with the little finger covered with a soft towel, while the child is inverted and held by the ankles. If in this position there are slight respiratory movements of the chest there is no danger, and the child will soon cry. In the more severe cases the deeper passages must be cleared, which is best done by means of a soft woven catheter open at the end (No. 14, French). The catheter is introduced along the index-finger of the left hand, which pulls the epiglottis forward, the instrument being pushed into the trachea by

a gentle twisting motion by the fingers of the right hand. With slight suction the contents of the trachea is drawn into the tube; the maneuver is then repeated until the air-passages are cleared. In asphyxia livida this is almost always sufficient, the irritation of the throat stimulating respiration.

In asphyxia pallida the air-passages must be at once cleared and artificial respiration begun. Only three are of service—rhythmical compression of the chest, the Schultze swingings, and mouth-to-mouth insufflations with the tracheal catheter.

Puerperal Aphasia.—Sinclair, M. A. M. *Lancet*, vol. clxiii, No. 4 of vol. ii, p. 204, July 26, 1902.

The writer reports seventeen cases, together with one of his own, which constitute the entire literature of this symptom.

The case which he describes is a woman aged 27, who presented no signs of cardiac or vascular disease, and who had a good family history. In the latter half of the seventh month of her fourth pregnancy she completely lost speech. She had gone to bed in the evening, and the following morning, after emotional excitement, she lost speech for a period of about an hour; later in the same forenoon she had a second loss of speech, this time coming on more gradually. At 3 P.M. of the same day embarrassment of speech was noted, and there was increasing difficulty until 9 P.M., when the attack culminated in the total loss of speech for the third time. On the following morning there was complete motor aphasia without agraphia. She could not articulate the simplest words, such as yes or no, nor could she repeat them after hearing them pronounced. It was evident that they were understood, and she could reply in pantomime, or in writing. On the following day there was paresis of the right upper extremity and some loss of sensation. From about the third day the speech returned slowly. At first there was ability to use the simple common words. At the end of three weeks she was so far recovered that she could use phrases and short sentences. More than two months after the attack she was delivered of a healthy child, labor being natural. At that time her speech was still hesitating. At the end of several months there was a perfect recovery of speech, together with a disappearance of the paresis of the right upper extremity.

Defects in speech are scarcely mentioned in obstetrical literature among the complications of labor. Kussmaul in his work on defects in speech does not mention a single instance of this symptom occurring as a complication of the puerperium. Poupon classes them

under two heads: (1) Those due to nervous origin; (2) those caused by vascular changes.

In the case reported by the writer hysteria could be excluded. The prognosis of the affection depends upon the nature of the lesion. Many of the recorded cases were transitory, recovery ensuing within a few days or weeks. There is a liability to recurrence of the aphasia in subsequent pregnancies. The second attacks are more serious than the first.

FORENSIC MEDICINE.

Prolonged Loss of Consciousness.—HOPKINS, S. D. *New York Medical Journal*, vol. lxxvi, No. 9, p. 367, Aug. 30, 1902.

Any case of disturbance of consciousness is worthy of record in the department of forensic medicine, as anomalies in this function are of the highest importance from a legal standpoint. The case described is that of a man 34 years of age, who was born and had lived in New York. For the six months preceding the attack he had been drinking rather freely, and noticed that his memory for recent events was poor, although he can recall the main occurrences up to some time in July, 1900. On July 4 of that year he visited a clubhouse some distance up the Hudson River from New York City. Two visits to the clubhouse were made, but the exact intervals between them and the dates are not remembered, although what occurred on the first visit is distinctly recalled. He remembers going to the clubhouse on the second occasion, which is stated by his brother to have been August, 1900. At that time he was seen walking on the river bank, but failed to put in an appearance at home that night. It was supposed that he was drowned.

From that time until September 21 the patient has no recollection of where he was or what he did. On that day, while walking on the street in Denver, he experienced a peculiar sensation as if some one was drawing a cap over his head and face. When he awoke everything appeared so strange to him that he inquired of a passer-by what street he was on, and when informed that he was on Larimer Street, said: "I do not know of any such street in New York City." Then for the first time he learned that he was in Denver, and also that he was dressed in a jumper and overalls, but was unable to recollect what had become of his business suit which he had worn at the time of his visit to the clubhouse on the Hudson.

The physical examination of the patient was negative, the only

nervous disturbance being the loss of memory. In the amnesic interval he performed hard manual labor, judging from the calloused condition of his hands. The marks on his shoes indicated that they had been purchased in Philadelphia, while his clothing was bought in Chicago. All the facts gathered showed that the patient was partially amnesic during July, and totally forgetful from August 6 to September 21, a period of forty-five days.

Voidable Releases in Personal Injury Cases.—*Journal of the American Medical Association*, vol. xxxix, No. 11, p. 651, Sept. 13, 1902.

The general rule regarding releases in personal injury cases is to sustain them where it could be shown that the person giving the release had a full understanding of the nature of the transaction. The Court of Civil Appeals of Texas has set aside a release which was said to have been obtained upon representations of the defendant's physician, who treated the injured person at an infirmary. The physician stated that the bones of the arm were united and the arm was well; that as soon as the swelling passed away the arm would be as good as ever; and that it would be safe to make a settlement. The facts in evidence warranted the conclusion on the part of the court that the physician made such representations to the party for the purpose of inducing him to execute the release, and that the injured person believed the statements were true and relied upon them. The bones of the arm at the time of the trial were not united, and the arm was practically useless.

The defendant company set up that the statement of the physician was a mere opinion, and hence had no nullifying effect upon the subsequent contract. This the court holds is unsound doctrine, saying that the physician's opinion amounted to a statement of fact, stating in effect that he was a sound man, that the bones had united, and that he would be all right. The fact that the statement made by the physician was not intentionally false did not affect the right of the party to have the release set aside if he was misled by the statement. Innocent misrepresentations may as well be the basis of release as where such statements are intentionally false.

Rupture of the Heart.—LEAK, R. L. *American Medicine*, vol. iv, No. 10, p. 374, Sept. 6, 1902.

In 560 autopsies five deaths were found to be due to rupture of the heart. These cases are of forensic importance, as they show a comparative frequency of this condition in a certain class of cases. The youngest patient in the group was 62 and the oldest 81. In all

the cases the arteries were said to be fibrous, and in two almost calcareous. The pulse before the rupture varied from 72 to 120. In only one was irregularity noted. In two there was hypertrophy of the heart, in two it was stated to be normal, and in one there was a systolic murmur. The hearts weighed respectively 9, 9.5, 10.5, 13, and 17 ounces. In four cases the rupture was in the left ventricle and in one in the right auricle. The microscopic examination showed no changes in two cases, in one there was fatty degeneration, in another marked brown atrophy with loss of the transverse striations, and granular degeneration, cell fragmentation, and somewhat similar microscopic findings in another case.

A Physician's Contract for Compensation.—*Journal of the American Medical Association*, vol. xxxix, No. 9, p. 506, Aug. 30, 1902.

In Doyle *vs.* Ewars the Supreme Court of South Dakota has decided on the character of the contract made with a physician in a manner that is of general interest, because of the frequency with which verbal contracts of this character are entered into and a non-specific amount charged for professional services. A physician brought suit against an administrator to recover for personal services, stating that he had informed the patient that his charge for an operation would be from $200 to $400. The court held that the contract was not too vague and indefinite upon which to base a cause of action, but was a valid contract for the sum of $200 at least, and that the value of the services up to $400 could be proven.

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ORIGINAL ARTICLES.

THE OCULAR MANIFESTATIONS IN CHRONIC BRIGHT'S DISEASE.[1]

BY G. E. DE SCHWEINITZ, A.M., M.D.,
Professor of Ophthalmology in the University of Pennsylvania.

The ocular lesions which may be associated with or caused by various forms of Bright's disease are these:

1. Complete blindness without ophthalmoscopic lesions, or at least without the presence of lesions more or less suggestive of disease of the kidneys, generally called uremic amaurosis, and most often seen in acute nephritis, but also in acute exacerbations of chronic renal disease.

2. Various types of retinitis and neuroretinitis, to which the descriptive term "albuminuric" is commonly applied, and which are most often seen in association with chronic forms of kidney disease.

3. Alterations in the caliber and relation of the retinal vessels owing to sclerotic changes in their walls, with or without hemorrhages and exudates in the retina, seen in association with those forms of renal disease in which vascular changes are evident elsewhere in the body; also isolated hemorrhages and exudates, without marked vessel-wall changes.

4. Alterations in the uveal tract, particularly in the choroid and iris.

5. Some varieties of cataract.

6. Paresis and paralysis of the ocular muscles, particularly the superior oblique and the external rectus.

7. Recurring subconjunctival hemorrhages.

In uremic amaurosis the loss of sight is often sudden, bilateral, and complete, so that even the perception of light is lacking. In

[1] Read before the Philadelphia County Medical Society, Oct. 8, 1902.

other instances light perception is not wanting and never entirely disappears, the visual disturbance coming on gradually. Sometimes the pupils are irresponsive to light stimulus, sometimes they react to light impulses. Ophthalmoscopic examination may be negative, but may also reveal a general edema of the retina, an edema located particularly around the optic nerve entrance, the so-called peripapillary edema, and fulness and tortuosity of the retinal veins. In a case recently seen in consultation with Dr. B. C. Hirst and Dr. James C. Wilson, this general edema of the retina was well marked, the appearances being best described by the word "foggy." Hemorrhages, exudations in the form of white plaques, so characteristic of the various types of renal retinitis, are lacking. Uremic amaurosis, to quote a sentence of J. B. Lawford, "may occur in any of the various forms of renal disease in which there is sufficient interference with excretion by the kidneys to load the blood with those poisonous materials, whatever their exact nature may be, which induce the uremic condition."

It is, however, more common in acute nephritis, particularly the nephritis associated with scarlet fever and pregnancy. Occasionally uremic amaurosis occurs in chronic nephritis which has already produced organic changes in the retina. Whether the ordinary uremic amaurosis is due to the action of a toxin on the cortical centers or on the retina is in dispute. Retention of the pupillary reflex with absolute blindness would indicate a lesion in the visual tract higher than the primary optic centers. It has seemed to me in some cases that I have studied, particularly the one already referred to, that the retinal elements themselves were intoxicated, and I know no reason why one should not assume that the toxic agent which the diseased kidneys have failed to eliminate should not act on the ganglion cells of the retina, just as many other toxic agents — for example, the toxin of diabetes and certain toxins brought about by intestinal fermentations—similarly act.

Systematic writers have divided the various types of retinitis and neuroretinitis associated with kidney disease as follows: Typical albuminuric retinitis, degenerative albuminuric retinitis, hemorrhagic albuminuric retinitis, albuminuric neuroretinitis, and albuminuric papillitis.[1] Now while it is true that these various forms occur, for practical purposes it is sufficient to recognize two varieties, an inflammatory or exudative and a degenerative type.

In the typical disease variously shaped and placed white spots appear in the macula or in its immediate neighborhood, sometimes at first discrete and sharply separated, but later and under other cir-

cumstances forming a star-shaped figure, the rays of which may completely or partially surround the fovea. Near the papilla, and often surrounding it, large yellowish-white spots and plaques appear, so that there is a ring-shaped zone around the nerve-head, forming a striking white area, to which the name "snow-bank of the retina" has sometimes been applied. Linear, flame-shaped, or round hemorrhages are scattered over the fundus. The blood-vessels may be partly buried in white exudate or pass over it. The veins are frequently dark, tortuous, and distended, the arteries not infrequently unchanged in size or smaller than normal. The optic papilla may be hyperemic, actually swollen, sometimes decidedly choked, and presenting all the appearances of an intense optic neuritis.

Such appearances, however, representing a picture which is exceedingly familiar and which at one time was believed to be absolutely characteristic of chronic Bright's disease, may be substituted by lesions which consist of white spots, often quite small and often separated by nearly normal areas, comparatively inconspicuous hemorrhages chiefly confined to the fiber layer of the retina, and changes in the vessels indicating sclerotic conditions of their walls, to which more accurate attention will be called later. This is the so-called degenerative type.

When there is a great involvement, both of retina and optic nerve, with marked exudations, hemorrhages, and inflammatory signs, the term exudative or inflammatory neuroretinitis is applied.

If the hemorrhages are the most conspicuous feature of the disease, there is no objection to the term "hemorrhagic," while if the optic papilla alone is chiefly involved, as is sometimes the case, we may use the term albuminuric papillitis.

That small, comparatively insignificant white dots, or small, soft, fluffy exudates, with here and there a hemorrhage, may be the first signs of renal retinitis is well known, and such appearances, especially if associated with vascular and perivascular changes presently to be described, should always call for a thorough urinary examination.

In recent times much attention has been paid to the ophthalmoscopic appearances which are seen in general arteriosclerosis, and which, indeed, are in many respects far more important from the diagnostic standpoint than the more or less typical types of renal retinitis, because, as a reviewer of Tirard's work on albuminuria and Bright's disease has well said, "these changes are often obvious in cases in which the usual retinitis has not developed." These changes have been discussed by a number of observers, particularly by Raehl-

mann, Hirschberg, Friedenwald, Marcus Gunn, myself, and others, and I have reviewed them somewhat in detail in my address before the Medical and Chirurgical Faculty of Maryland, April 26, 1900,[2] where the literature is given. Quite recently Raehlmann has returned to this subject in an admirable article[3] which deals with the ophthalmoscopic diagnosis of sclerotic disease of the retinal vessels, and in which the literature is extensively quoted. From my own paper, following Mr. Marcus Gunn's admirable classification, I may be permitted to quote the ophthalmoscopic signs which may be encountered in general arteriosclerosis, and therefore in many cases of chronic renal disease:

1. Alterations in the course and caliber of the retinal arteries, manifesting themselves as (*a*) undue tortuosity, which is not significant unless, to quote the words of Mr. Gunn, it is associated with other evidence of disease; (*b*) alterations in the size and breadth of the retinal arteries, consisting of general contraction of one or more branches, or more suggestively, of alternate contractions and widenings, where, for example, a vessel may proceed with practically normal caliber for a certain distance, then suddenly narrow almost to a thread, again fill out, and again narrow, thus presenting, as it were, a beaded appearance.

2. Alterations in the reflections from, and the translucency of, the walls of the retinal arteries, manifesting themselves (*a*) in increased distinctness of the central light streak on the retinal vessel and an unusually light color of the entire breadth of the artery. The vessels, as Mr. Gunn points out, give the impression not only of increased brightness of the central light streak, but of an unusual reflection from the arterial coat. (*b*) Loss of translucency, so that it is impossible to see, as is possible in the normal state, through the artery an underlying vein at the point of crossing; (*c*) positive changes in the arterial walls, consisting of whitish stripes, indicating degeneration of the walls, or infiltration of the perivascular lymph sheaths.

3. Alterations in the course and caliber of the veins, together with signs of mechanical pressure, manifesting themselves (*a*) in undue tortuosity, which, as in the case of the arteries, is not significant except in the presence of other disease; (*b*) alternate contractions and dilatations; (*c*) an impeded venous circulation where a diseased artery crosses it.

The last is the sign which Mr. Gunn particularly dwells upon, and which, in my experience, is of the utmost importance. Ordinarily, as an artery crosses the vein, as may be seen by an examina-

tion of the normal eyeground, there is no sign of pressure, and the translucent vein permits a view of the artery beneath it. If the walls of the artery are thickened by disease, then it presses upon the vein, pushes it aside, or directly contracts its caliber, so that beyond the point of crossing there is an ampulliform dilatation. So, also, where the vein overlies the artery there may be a similar contraction of the venous caliber and dilatation on either side of the spot of crossing. (*d*) Changes in the venous walls, precisely as they occur in the arteries, so that whitish stripes border the vessel, and are indications of degeneration in its walls. Often associated with this one may see varicosities, as already pointed out by Raehlmann.

4. Edema of the retina, manifesting itself as a grayish opacity, which may be present in the immediate neighborhood of the papilla, or in spots over the eyeground and along the course of the vessels, looking like a fine gray haze, or in little fluffy islands far out in the periphery.

5. Hemorrhages, manifesting themselves as linear extravasations along the course of the vessels, roundish infiltrations scattered over the fundus, or sometimes, when extensive, in drop-like form, especially in the macular region, forming the so-called subhyaloid hemorrhages. As a result of hemorrhages there are frequently scattered through the eyeground yellowish and whitish-yellow spots bordered with pigment, indicating the atrophy of the elements that has taken place during the course of the absorption of hemorrhage.

Varieties of Renal Disease which Produce Retinal Lesions.—In general terms it may be said that ocular lesions may occur with any form of nephritis, but there is no question that the various types of retinitis are most frequently associated with chronic interstitial nephritis, that is with renal sclerosis, whether this is an independent primary affection or whether it is a sequel of arteriosclerosis. Various types of retinitis and retinal lesions may be symptoms of chronic parenchymatous nephritis. Some observers, for example Samuel West,[4] make a sharp distinction between the degenerative and exudative forms of albuminuric retinitis, believing that the former is indicative of chronic granular nephritis, and that the degenerative changes depend upon vascular alterations, while the latter indicates a chronic parenchymatous nephritis and depends upon an inflammatory or toxic influence.

Naturally, the so-called secondary contracted kidney, which is a sequence of the large white kidney, may be associated with retinitis. The statement is frequently made that amyloid disease of the kidney

produces albuminuric retinitis, and of course there is no reason why it should not, because lardaceous degeneration of the kidneys is not a separate disease, but purely an event in the course of Bright's disease, most frequently, if I mistake not, occurring in parenchymatous nephritis of cachectic origin. Although uremic amaurosis, to which reference has already been made, is generally seen with acute forms of Bright's disease, there is no reason why an amaurosis of this character should not take place, as, indeed, it not infrequently does take place, during the course of a retinitis caused by chronic kidney disease, as the result, for example, of an exacerbation of the renal lesions.

Date of Occurrence.—It is practically impossible to state exactly when the retinal lesions of renal disease will appear. At one time it was supposed that they began at the same period that cardiac hypertrophy was manifest, but this certainly is not a constant association. In general terms I think it may be stated that the renal disease has been present for some months before the retinal lesions appear, but the very fact that the retinal lesions may be the very first signs of the kidney disease—indeed, the means by which the kidney disease is discovered—renders the answer to the question all the more difficult.

While it is true that retinitis, retinal hemorrhages, etc., may precede albuminuria by a considerable length of time, it is probable, as Dr. Sutton suggests, that these are examples of granular kidney in which albumin is absent, or only present to a very small extent until a later stage of the kidney affection.[5] On the other hand, the lesions which I have described as occurring in the blood-vessels, particularly various types of perivasculitis, and of "silver-wire arteries" producing compression upon under- and over-lying veins, are often present for long periods before the renal lesions are manifest, or at least before the other signs of renal disease are fully established—that is, albumin and casts. It is for this very reason that they as part of the symptomatology of arteriosclerosis, which may eventuate in renal sclerosis, are so exceedingly important. More than this, they may be obvious in cases in which the usual renal retinitis will not develop, because they are forerunners of a process which, as I have elsewhere pointed out, may terminate fatally before the development of fully established nephritis.

Age in which Renal Lesions Occur.—Inasmuch as chronic interstitial nephritis is a rare disease before the twenty-fifth year, its percentage rising between that age and forty and growing still greater between forty and sixty, the retinal lesions are likely to appear at

the same age, but it should be remembered that they may occur at any age, and that even children are not exempt. I do not now refer to uremic amaurosis, for example, in scarlatinal nephritis, but to the fact that the so-called typical albuminuric retinitis is seen in children. A good example has been reported by Mr. Arnold Lawson and Dr. G. A. Sutherland,[6] the patient being only twelve years of age. The youngest case recorded by Bull[7] in his analysis of 103 cases of exudative neuroretinitis associated with chronic Bright's disease was five years of age.

Frequency of Renal Lesions in Chronic Bright's Disease.—As J. B. Lawford[8] states, it is difficult to ascertain the proportion of renal disease in which retinitis occurs. He quotes the following percentages: 9 per cent (Wagner), 13 per cent (Wadsworth), 28 per cent (Eales), and 33 per cent (Galezowski), and expresses the opinion that the figures of Eales and Galezowski most nearly represent the correct percentage. According to William F. Norris, than whom there was no more careful observer, fully 25 per cent of the cases of chronic Bright's disease as they occur in general hospitals are affected by various forms of retinitis. My own experience yields an equally great if not greater percentage, and if are included not alone the cases in which there are more or less typical forms of retinitis and retinal lesions, but also those in which the ophthalmoscopic signs are comparatively insignificant, existing chiefly in the forms of alterations in the walls of the retinal vessels, the percentage will rise much higher.

Prognosis.—The prognosis *quoad visum* depends entirely upon the character and situation of the exudates—*i.e.*, upon the amount of destruction of the percipient elements of the retina. Not infrequently florid types of albuminuric retinitis—*i.e.*, the so-called inflammatory or exudative varieties—clear up more decidedly and more rapidly than the less pronounced varieties of the disease; but I believe with Charles S. Bull and William F. Norris that although improvement in vision often occurs, indeed sight may rise to the normal standard, there is rarely, if ever, entire disappearance of the stellate exudate in the macula. Even when albuminuric retinitis is caused by a syphilitic affection of the kidney, and appropriate treatment causes absorption of the retinal hemorrhages and exudates with restoration of perfect vision, some white stellate dots are left in the macula, as in a recent case admirably reported by C. Zimmerman.[9] Some authors, for example C. A. Oliver,[10] have described a marked difference between the ophthalmoscopic conditions seen in interstitial nephritis as found in dispensary service and general

hospital practice. In the latter the eyeground is often examined in the incipiency of the disease, or when the lesions are most pronounced; in the former the active retinal lesions have often largely subsided and the secondary degenerative changes are evident, with a marked depreciation of vision, which, indeed, has caused the patient to seek advice, and by reason of which the disease from which he is suffering has been discovered. The bearing of these facts on prognosis is evident.

Deterioration and destruction of sight may also occur as the result of detachment of the retina, secondary atrophy of the optic nerve, retrobulbar neuritis and hemorrhages into the optic nerve sheath, and secondary glaucoma.[11] It is possible that detachment of the retina may occur independently of the retinitis, although I do not think this has been definitely proved; doubtless it is more common, as Lawford maintains, than is generally supposed.

The prognosis *quoad vitam* is bad. In Bull's list more than 50 per cent of the cases died within the first year, and in general terms it may be stated that it is exceedingly uncommon for patients with albuminuric retinitis to live longer than two years. Of course I know there are exceptions to this rule, that patients have lived five, seven, and even greater number of years after the retinal lesions have developed. In this particular there is a marked difference between hospital and private patients. Naturally, those who can afford the best treatment, climatic, as well as dietetic and therapeutic, have the best chance for prolonging their lives. Belt's statistics are interesting in this particular. He collected 155 cases from private practice, of which 62 per cent died within one year, 85 per cent in two years, and 14 per cent lived more than two years. He collected seventy-five cases from hospital practice, and of these 85 per cent died within one year, 93 per cent within two years, and 6 per cent lived more than two years.

That the prognosis of retinitis associated with the albuminuria of pregnancy and scarlatinal nephritis is much more favorable than the retinitis of chronic Bright's disease is well known, but does not come into discussion in the present communication. Whether successful decapsulation of the kidney for the relief of chronic nephritis is followed by notable improvement of coexisting retinal lesions I do not know. This subject is now being investigated by Dr. Suker, of Chicago.

Diagnosis.—Nearly thirty-five years ago, that singularly keen observer, Mauthner, said that the appearance of the retina so frequently found in chronic Bright's disease was absolutely character-

istic of the kidney affection, and that the ocular examination under these circumstances was more satisfactory than a urine analysis. I am inclined to think that this belief is still wide-spread; but it is not entirely accurate. So long ago as 1869 Schmidt and Wegner[12] pointed out the similarity of the neuroretinitis of brain tumor and of Bright's disease, and reported a case of bilateral neuroretinitis with all of the appearances which are considered characteristic of retinitis albuminurica, but in which the post-mortem showed a gliosarcoma of the brain and that the kidneys were entirely normal. Von Graefe himself, prior to Schmidt and Wegner's paper, made a similar observation. The subject has been well discussed by Mr. Marcus Gunn,[13] whose experience agrees with that of Dr. James Taylor that where the macular figure occurs under these circumstances there is usually cerebellar tumor. That also has been my own experience, and I have seen and studied with Dr. A. G. Thomson in the Infirmary for Nervous Diseases several cases of cerebellar tumor in which the lesions, the macular ones at least, exactly simulated those which are most often caused by chronic Bright's disease.[14] I have, however, also seen the macular figure well marked in one case of tumor of the parietal convolutions in the Philadelphia Hospital. Not only does the star-shaped macular figure occur in the neuroretinitis of brain tumors, but it is also seen in syphilitic retinitis and in retinal hemorrhages, especially as they occur in young people. Indeed, Haab believes that this figure is simply a representative of an intense vascular disease with interference of the retinal circulation, and is caused by the accumulation of fatty granules in the cone fibers of the macular region, and is not due, as is often taught, to fatty degeneration of the ends of Müller's fibers.

The occasional similarity between cerebral neoplasm and chronic Bright's disease is not limited to the neuroretinal lesions. Not infrequently, as Charles W. Burr[15] has well shown, there is distinct mimicry of brain tumor by chronic nephritis in its general and particularly its nervous manifestations.

Usually both eyes are affected in albuminuric retinitis, although it is common to find more extensive lesions in one eye than the other, just as one kidney is often more diseased than its fellow, but it should be remembered that unilateral renal retinitis, to quote Knies's expression, is not a rarity. This fact I have elsewhere discussed.[16] A certain percentage of cases maintain monocular retinal lesions until death. In another larger percentage of cases the unilateral character of the affection continues for a certain period of time, but ultimately becomes bilateral.

Many of the retinal lesions which one sees in association with chronic Bright's disease cannot be said in one sense to be typical of this affection—for example, single or scattered hemorrhages without white exudates, certain forms of perivasculitis, and particularly the alterations in the caliber of the vessels of the retina already described. They are, if you choose, significant of arteriosclerosis, and in that sense significant of a condition which may eventuate in chronic nephritis, if this disease has not already appeared. At all events, they are strong indications for thorough urinary analysis; indeed, the same may be said to be true of any retinal condition where hemorrhages and vascular changes exist, be they great or small.

Diseases of the Uveal Tract in Chronic Nephritis.—In many cases of retinitis albuminurica the underlying choroid is also affected by inflammatory vascular and exudative disease, but the choroidal lesions are not evident to the ophthalmoscope and can be seen only on microscopic examination. Special forms of choroidal disease, however, somewhat resembling pigment degeneration of the retina have been described. Iritis is occasionally observed. According to Knies, in the absence of any other cause, an iritis or iridocyclitis might be attributed to albuminuria because the latter is often associated with extensive disease of the iris vessels, and therefore this membrane will be susceptible to those causes which readily excite iritis. In the Philadelphia Hospital I have on a number of occasions found albumin in the urine of patients suffering from iritis, but I have never been able to establish a causal relationship because there were too many other likely and well known etiological factors that could not be eliminated with certainty.

Nephritic Cataract.—Naturally, the various types of Bright's disease have been brought into connection with the formation of cataract, particularly by Deutschmann.[17] In his last communication on this subject he reported the examination of 230 patients with uncomplicated cataract, among whom 5 per cent were undoubtedly nephritic and 11 per cent probably affected with Bright's disease. Most elaborate examinations to determine this point and to test the trustworthiness of Deutschmann's albuminuria theory have been made by Evetzky,[18] whose results indicate that albumin does not mean nephritis, that nephritis and cataract may combine, that in young nephritics there is no cataract, and in old ones not more, usually, than in those who are without the signs of Bright's disease. In other words, a causal relationship between nephritis and cataract has never been established.

Ocular Muscle Palsies Due to Nephritis.—These must be rare, or

perhaps are only rarely reported. Knies has particularly called attention to them, and has recorded abducens paralysis, superior oblique paralysis, and external ophthalmoplegia. To this list may be added a good report of paralysis of the superior oblique in nephritis by H. F. Hansell.[19] One point is of importance from the prognostic standpoint, namely, as Knies points out, these muscular palsies may be terminal symptoms of albuminuria. They are indicative of changes in the cerebral vessels similar to those which are found in the retina and elsewhere in the body.

Recurring Subconjunctival Hemorrhages.—In general terms it is well known that recurring subconjunctival hemorrhages may be a sign of chronic renal disease. I am inclined to think that this manifestation has not received the place it deserves among the ocular signs of nephritis. To be sure, a number of writers—for example, Talko, D. B. St. John Roosa, Frank Ring, Charles Stedman Bull, and myself—have called attention to this matter, but more commonly text-books when describing nephritis are silent with reference to this symptom, although other hemorrhagic phenomena, epistaxis, purpura, retinal extravasations, etc., are recorded. I have discussed this matter in some detail in an oration before the Medical and Chirurgical Faculty of Maryland, and may perhaps be permitted to quote from that paper: "In my experience these subconjunctival ecchymoses have occurred in persons past forty, and usually during sleep, the patient being surprised on waking in the morning to find a more or less extensive subconjunctival extravasation, most frequently, I think, in the left eye. In one case they may occur at comparatively short intervals; in another the periods between the attacks may comprise several weeks or even months. In five cases seen recently, three of the patients having died, the ages were in two between forty and forty-five, in one between fifty and sixty, and in one between sixty and sixty-five. The fatal issue occurred within three years after the first subconjunctival hemorrhage was noted, and these hemorrhages were the first sign which called attention to the chronic contracted kidneys from which they all suffered. What the relative frequency of these subconjunctival hemorrhages is compared with other more commonly described ocular manifestations of nephritic origin is not apparent, owing to insufficient data. Sometimes it would seem that they may be associated with the ordinary retinitis of nephritis, but this is not my own experience. Sometimes in a certain sense they may at times replace the retinal lesions of chronic nephritis; certainly they may precede them. If this association of Bright's disease and

recurring subconjunctival hemorrhages is a matter of common observation, as indeed it well may be, at least the fact has not been emphasized, and the simple rule to examine the urine carefully in each such case may lead to the discovery of a serious renal disorder, which, as William Osler has said, is frequently latent, and even in an advanced grade may be compatible with great mental and bodily vigor."

Of course, hemorrhages of this character occurring in elderly people are indicative of ordinary angiosclerosis, and are only one of the many signs of this condition, but what I wish to point out is that they are not confined to the eyes of old people, but may be seen, as I have just quoted, in those not much over forty, and in subjects, moreover, in apparently perfectly vigorous health, and when signs of arterial degeneration are not evident in the radials or temporals. One patient to whom I have referred scouted the idea of the necessity of urine examination, although within three months he had had three spontaneous subconjunctival hemorrhages, none of them very large, and all of them disappearing quickly, a peculiarity which, if anything, enhances the significance which I have given them. They are the little leaks announcing that a greater break is not far off.

An exactly analogous condition may appear in the delicate skin of the lower eyelid, and should, therefore, be designated recurring subcutaneous ecchymosis. The spots are only a few millimeters in length, of a slightly purplish hue, resembling a small bruised area, and, like their congeners in the conjunctiva, they come and disappear quickly. They undoubtedly have exactly the same significance. Indeed, in one case I have seen the subconjunctival and subcutaneous ecchymoses alternate. It is unnecessary to dwell further upon this subject, except again to emphasize the importance of observing changes in the subconjunctival and episcleral vessels and their relationships to serious wide-spread general vascular disorders, and therefore to chronic Bright's disease.

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A CASE OF GLIOMATOSIS.[1]

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Cavities in the spinal axis may be of varied character and origin. Thus, Schlesinger in his elaborate monograph on Syringomyelia (Franz Deuticke, Leipsic and Vienna, 1902) divides them anatomically into the following groups:

SPINAL.

I. Cysts: (*a*) Secondary to traumatic destruction; (*b*) secondary to traumatic hematomyelia; (*c*) secondary to non-traumatic hematomyelia.

II. Inflammatory and non-inflammatory softening of short duration.

III. Syringomyelia: (*a*) True hydromyelia (as a malformation); (*b*) true neoplasm with cavity formation; (*c*) glious syringomyelia; (*d*) syringomyelia secondary to vascular disease without gliosis; (*e*) pachymeningitis with cavity formation.

BULBAR.

I. Cysts secondary to softening and hemorrhage.

II. Inflammatory softening of short duration.

III. Fissures secondary to disintegration of tumors.

IV. True syringobulbia (in typical situations): (1) Preformed in embryonic life, median in situation: (*a*) in combination with hydromyelia or syringomyelia; (*b*) independently of hydromyelia and syringomyelia. (2) Developed later in life, lateral in situation: (*a*) as a continuation of syringomyelia; (*b*) confined to the bulb.

Schlesinger defines syringomyelia as a chronic progressive spinal affection of varied etiology, attended with the development of longitudinal cavities, involving especially the central portions of the cord, and often also with considerable proliferation of neuroglia in immediate proximity to the cavities. The clinical picture is extremely variable and is characterized essentially by divers motor, sensory, trophic, and secretory disorders of central origin and of varying intensity and extent, by the presence frequently of predominantly unilateral bulbar symptoms and by almost constant alteration in the reflexes. Disturbances on the part of the bladder and the rectum

[1] Report read and patient presented before the Section on General Medicine of the College of Physicians of Philadelphia, Oct. 13, 1902.

are less common. Among the sensory derangements those involving the pain sense and the thermic sense occur with especial frequency.

The following clinical types have been differentiated:

1. Syringomyelia with classic symptoms: (*a*) Cervical type; (*b*) dorsolumbar type; (*c*) sacrolumbar type; (*d*) bulbomedullary type (syringobulbia).

2. Syringomyelia with predominant motor symptoms: (*a*) Simulating amyotrophic lateral sclerosis; (*b*) simulating spastic spinal paralysis; (*c*) humeroscapular type.

3. Syringomyelia with predominant sensory symptoms: (*a*) Hysterical sensory hemiplegia and zones of imitative type; (*b*) general anesthesia.

4. Syringomyelia with predominant trophic symptoms: (*a*) With Morvan complex; (*b*) osteoarthritic variety.

5. Tabetic type.

6. Pachymeningitic type.

Syringomyelia is more frequent in men than in women, in the proportion of about two to one. The first symptoms are most commonly noted early in life, beginning in the largest number of cases in any decennial period between the ages of 21 and 30 years; in the next largest number between 11 and 20; and in the next in order between 31 and 40. These three periods comprise together the inception of four-fifths of all the cases. In Schlesinger's opinion syringomyelia or central gliosis is one of the most common diseases of the spinal cord, being next in frequency to tabes, syphilis, and compression of the cord. He has himself studied 100 cases in the course of eight years, and he has seen others cursorily.

Among the etiologic factors concerned in the disease are the following:

Developmental anomalies involving the entire central nervous system, or only the central canal and its immediate proximity, are present in a large proportion of cases, probably in the majority.

Disintegrating tumor-like hyperplasias of the glia (gliosis) probably develop in large part as a result of congenital or acquired predisposition from the operation of exciting causes upon the spinal cord.

Traumatism with severe initial symptoms often gives rise to the formation of cavities in the spinal cord, but these are not as a rule progressive, and not to be classed with syringomyelia. Traumatism without severe initial symptoms may give rise to progressive gliosis, but this probably requires a congenital predisposition on the part of the cord.

Tumors presenting macroscopically marked characters of neoplasm (glioma and sarcoma) may be associated with the presence of cavities in the cord.

Increase in intracranial pressure from various causes is alone incapable of giving rise to syringomyelia.

Infectious diseases may give rise to gliosis or syringomyelia.

Leprosy plays no part in the etiology of syringomyelia.

Syphilis is an important factor in the etiology of syringomyelia.

Vascular changes and vascular occlusion may cause fissures in the cord.

Chronic inflammatory processes may possibly contribute to the development of gliosis and syringomyelia.

Chronic meningitis may cause the formation of cavities in the cord.

I wish to report a case that by reason of the period of life at which the symptoms first appeared, of the character of the symptoms themselves and their progressive development, and of the absence of obvious etiologic factors, I believe to be one of gliosis or syringomyelia of cervical type. The symptoms exhibit a tendency to unilateral predominance, and they indicate also involvement of bulbar nerves.

The patient, a woman 45 years old, born in Germany, a widow, engaged in housework, presented herself on account of tingling in both hands and contractures in the right hand. She related that five years previously she had begun to notice numbness in the little finger of the right hand associated with tingling. This finger soon became contracted, and the patient lost most of her power over it. In a little while contractures developed in the remaining fingers of the same hand. The patient now began to notice that she could not distinguish between heat and cold, and she burned herself accidentally without painful sensation. In the course of a year a sensation developed as if water were pouring down the back. For about a year the right leg had been weak and had felt as though it were bandaged; it also became insensible to heat and cold. In a short while the left leg became similarly affected. For five months the left arm had exhibited paresthesia. On examination sensibility was found to be variable in the right hand, being reported at times as present, and at other times as absent. Pain sense was diminished and localization was defective. The patient described a penholder held in the hand as a pencil. She failed to recognize a penknife or a quarter of a dollar. She was unable to distinguish heat and cold with either hand,

although the two were distinguished on the face. There was some wasting of the intrinsic muscles of the right hand. There was no difficulty in speech or in swallowing. The knee-jerks were increased, especially the right, and there was slight ankle-clonus on the right. The right pupil was distinctly the smaller and the right palpebral fissure the narrower. The lines on the left side of the face were more pronounced than those on the right, and the left side of the mouth was more active than the right. With the eyes open station was quite good, while with the eyes closed it was at first slightly unsteady. The patient stated that she had difficulty in getting out of bed, accomplishing the act by rolling out. The urine was free from albumin and sugar. The patient gave a history of measles and typhoid fever in childhood, and of rheumatism involving especially the left leg and keeping her in bed for one month at the age of 31. Her mother was dead of asthma, her father of old age. One brother had died in infancy and another as the result of injury. One sister was dead of typhoid fever. Two sisters, two brothers, and four children were living and well. Her husband had died of heart disease.

At a later date the patient described a sense of numbness referred to the calves of the legs and preventing comfortable walking. The appetite was impaired; the bowels were kept free. Sleep was poor; there was no headache or vertigo. The fingers of the right hand were flexed on the palm, and there was partial flexor contracture of the right arm and forearm, with extensor weakness. There was now distinct impairment of sensibility in the right hand, and an inability to distinguish heat from cold in both hands. On the left forearm heat could be recognized, but not cold, while on the right forearm both heat and cold were described as warm. Subsequently on the left arm also both heat and cold were described as warm. Pain sense was greatly impaired in the right hand. The gait was rather awkward, the foot being brought down on the toes. The patient stated that the feet felt convex, as though resting on a cushion. The left pupil was of fair size, while the right appeared diminished. Station was steady. The knee-jerks were much exaggerated on both sides; there was slight ankle-clonus on the right, but none on the left. The fundus of the eye was found normal. The right pupil measured 1.5 millimeters in diameter, the left 3 millimeters. Under cover the right eye turned slightly inward, in consequence of spasm of the internal rectus. The pupil when covered contracted, and when exposed it dilated. The left eye when examined yielded the same results. Both pupils contracted

in accommodation and in convergence. Diplopia was present to the right and the left sides, the false image being in the same plane and slightly tilted to the right. There was impaired rotation of the eyes outward and double homonymous diplopia.

The sensory dissociation, the muscular wasting and the associated weakness, the contractures in the upper extremities, and the exaggeration of the reflexes in the lower extremities, constitute a classic and unmistakable clinical picture.

The appearance of the symptoms primarily, and their predominance, in the right hand, with subsequent involvement of the left, points to a lesion of the cervical portion of the cord, the more extensive in its right half, while the inequality of the pupils and of the palpebral fissures, the spasm of the internal rectus of the right eye, the aberrant pupilary reactions, and the asymmetry of the face, are indicative of invasion of the medulla by the morbid process.

GALL-STONES, OR CHOLELITHIASIS.[1]

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Gall-stones, cholelithiasis, and biliary calculi are terms used to designate the formation of concretions in the bile tract. They are usually found in the gall-bladder, but may also be located in the cystic duct, the common bile-duct, the hepatic ducts, and occasionally in the peritoneal cavity, or intestinal tract; having reached these locations by perforation of the gall-bladder or common bile-duct.

The importance of the subject will be appreciated when we consider that, out of reports of 13,047 autopsies collected by Brockbank, 7.4 per cent had gall-stones.

They are found more frequently in women than in men, the proportion being about three to one (Dujardin-Beaumetz). Schroeder states that in Germany they are found in 20 per cent of female and in 4.4 per cent of male autopsies. They vary in size from a concretion just perceptible to the naked eye to a mass weighing as much as 3⅝ ounces (Richter's work, entitled "Medical and Surgical Observations," 1793). They assume various forms, round, oval, elongated, and angular, with the surface sometimes smooth or faceted. When large they are often single, but when small they are usually numerous, several hundred being not infrequently found. Although the usual color is dark yellow or brown, they may be white or gray, or even quite black. I recall seeing a large single stone in an autopsy by Dr. L. Hektoen, in the Cook County Hospital, Chicago, which was dark in color. In consistency they are usually firm, but in many cases may be fractured by pressure between the thumb and forefinger.

Cholesterin occurring in the crystalline form is the chief constituent, but bile pigments, bile salts, lime, mucus, degenerated epithelium, and bacteria may enter into their composition. The stearate, palmitate, and marjarate of lime combined with mucus usually form the cement which solidifies the cholesterin crystals.

Cholesterin (in chemical composition a monatomic alcohol), the chief constituent of biliary calculi, occurs normally, not only in the blood, but also in the various organs of the body. It is believed by some that it is formed in the bile-ducts or gall-bladder, as a product of the epithelium of the bile-passages.

The question naturally suggests itself: Why is it that cholesterin, which is ordinarily present in all persons, should form calculi in

[1] Read before the Salt Lake County Medical Society, Oct. 13, 1902.

some and not in others? In some cholesterin may be in excess, while in others there may be a diminution of the bile salts that should hold it in solution, or it may be precipitated from solution.

Anything that causes stagnation of the bile (tight lacing, sedentary habits, improper diet, insufficiency of water, constipation of the bowels, chronic indigestion, etc.) may predispose to the formation of biliary calculi. Whatever, therefore, leads to a regular emptying of the bile-passages will tend to clear out cast-off cells, mucus, and incipient collections of cholesterin, and thus aid in the prevention of the formation of gall-stones.

Recently the view has been gaining ground that bacteria are important etiological factors in the formation of biliary concretions. Dr. C. F. Pinkerton, acting on my suggestion, has examined gall-stones removed from cases at the Holy Cross Hospital. The organisms most commonly found are the bacillus coli communis and the typhoid bacillus. Occasionally the streptococcus and the pneumococcus are found. In 1880 Benrhein directed attention to the relation between typhoid fever and biliary calculi. Halstead states that about one-third of his cases operated for gall-stones give a history of having had typhoid fever. Robson has noted the connection in many cases of cholelithiasis.

Schroeder gives the following table showing the ages at which gall-stones are found, with their relative frequency:

Under 20 years of age	2.4 per cent.
From 20 to 30 years of age	3.2 per cent.
From 40 to 50 years of age	11.1 per cent.
From 50 to 60 years of age	9.9 per cent.
Over 60 years of age	25.2 per cent.

Dr. G. F. Still reports three cases of gall-stones in children. The ages of two were nine months and eight months respectively. The age of the third case is not given.

Pregnancy seems to predispose, also the wearing of corsets or tight bands around the waist, especially if combined with an insufficiency of out-of-door exercise.

According to Robson, the diet exercises a strong influence in the formation of biliary calculi. The glycocholate and taurocholate of soda, solvents of cholesterin, are formed from the metabolism of nitrogenous food; consequently if the supply of nitrogen in the food be limited, the bile salts are likely to be diminished and cholesterin may be precipitated. In England, where meat is used extensively, cholelithiasis is less prevalent than in Germany, where a greater amount of farinaceous food is used. The ingestion of an

abundance of albuminous materials lessens the tendency to the deposition of cholesterin. The drinking of hard water is said by some to favor the formation of gall-stones containing lime, but this is very uncertain. An insufficiency of pure water may act as a cause. Gall-stones sometimes reform after an operation for their removal, as in a case reported by Dr. Holman. In his case the silk ligatures acted as nuclei for the secondary formation, which were removed about twenty months after the first operation.

Dr. A. J. Ochsner emphasizes the following symptoms as being suggestive or diagnostic of cholelithiasis:

1. Digestive disturbances, a feeling of weight or burning in the vicinity of the stomach after eating; gaseous distention of the stomach.

2. A dull pain extending to the right from the epigastric region around the right side about at a level with the tenth rib, extending to a point near the spine and upward under the right shoulder-blade.

3. A point of tenderness between the ninth costal cartilage on the right side and the umbilicus.

4. A history of having had one or more attacks of appendicitis, or typhoid fever.

5. In many cases a slight tinge of yellow in the skin, not sufficient to be recognized as icterus, but observable on close inspection, especially on the days on which the patient is not feeling very well, or complains of biliousness.

6. Increase in liver dulness.

In a large number of cases there is a history of stomach trouble or dyspepsia. In certain cases there is depression of the spirits, with a feeling of discomfort or weight, or even vague pains over the right side of abdomen. One of my patients, from whom a single large gall-stone was removed from the bladder, was a man aged 60 years, who said he had stomach trouble for about ten years. He usually complained more of the pain at night, between nine and eleven o'clock. There was tenderness at a point midway between the umbilicus and the ninth costal cartilage on the right side. An examination of his stomach contents after a test meal showed an absence of HCl with butyric acid fermentation.

The typical gall-stone pain comes on suddenly, when the patient is quite well, and usually ends by causing nausea and vomiting. The vomiting has a tendency to relax the ducts, and occasionally a small gall-stone passes, thus terminating the attack. In several cases Robson has noticed, the pain began on the left side over the stomach. In these cases adhesions of the stomach to the gall-

bladder or bile-ducts were found. The vomiting, while usually associated with the colic, may be persistent and exhausting to the patient. Collapse due to intense pain with extrusion of a calculus into the duodenum has been reported. Violent contraction of the muscular wall of the gall-bladder during an attack may simulate the formation of a tumor, and is often found in the more chronic cases (Robson). Gall-stones are occasionally found, if properly searched for, in the bowel movements after an attack.

Dr. Wm. Osler gives the following group of symptoms as pathognomonic of gall-stones in the common duct:

1. Jaundice of varying intensity, deepening after each paroxysm, which may persist for months and even years.

2. Ague-like paroxysms characterized by chill, sweating, and fever, and followed by deepening of the preëxistent jaundice.

3. At the time of the paroxysms, pains in the region of the liver, with epigastric disturbances.

Robson gives the following comprehensive list of complications which may occur:

1. Ileus due to atony of the bowel, leading to enormous distention, and to the symptoms and appearances of acute intestinal obstruction, apparently the consequence of the violent pain.

2. Acute intestinal obstruction dependent on (*a*) paralysis of gut due to local peritonitis in the neighborhood of the gall-bladder; (*b*) volvulus of small intestine; (*c*) stricture of intestine by adventitious bands originally produced as a result of gall-stones; (*d*) impaction of a large gall-stone in some part of the intestine after ulcerating its way from the bile channels into the bowel.

3. General hemorrhages, the result of long-continued jaundice, dependent either on gall-stones alone, or on cholelithiasis associated with malignant disease.

4. Localized peritonitis producing adhesions, which may then become a source of pain even after the gall-stones have been got rid of. We believe that nearly every serious attack of biliary colic is accompanied by adhesive peritonitis, as experience shows that adhesions are found practically in all cases where there have been characteristic seizures.

5. Dilatation of the stomach dependent on adhesions around the pylorus.

6. Ulceration of the bile-passages, establishing a fistula between them and the intestine.

7. Stricture of the cystic or common duct.

8. Abscess of the liver.

9. Localized peritoneal abscess.
10. Abscess in the abdominal wall.
11. Fistula at the umbilicus, or elsewhere on the surface.
12. Empyema of the gall-bladder.
13. Infective and suppurative cholangitis.
14. Septicemia or pyemia.
15. Phlegmonous cholecystitis.
16. Gangrene of the gall-bladder.
17. Perforative peritonitis due to ulceration through, or to rupture of, the gall-bladder, or the ducts.
18. Extravasation of bile into the general peritoneal cavity.
19. Pyelitis on the right side due to a gall-stone ulcerating its way into, or an abscess of the gall-bladder bursting into, the pelvis of the kidney.
20. Cancer of the gall-bladder or of the ducts.
21. Subphrenic abscess.
22. Empyema of the right pleura.
23. Pneumonia of the lower lobe of the right lung.
24. Chronic invalidism and inability to perform any of the ordinary business and social duties of life.
25. Suppurative pancreatitis.
26. Chronic interstitial pancreatitis.
27. Infective endocarditis.
28. Cirrhosis of liver.

Sir F. Treves reports twenty cases of obstruction of the bowel due to gall-stones. Of these six were relieved spontaneously and fourteen died. Prompt operative intervention is indicated in all such cases.

H. L. Barnhard, of the London Hospital, reports in the August number of the *Annals of Surgery* a case of acute intestinal obstruction due to a large gall-stone, which was found on opening the abdomen to be impacted in the ileum at a distance of about five feet from the ileocæcal valve. The patient made a satisfactory recovery.

The diseases simulating cholelithiasis are: appendicitis, right renal colic, acute dyspepsia with flatulence, malignant diseases of the stomach or liver, and lead colic.

Paroxysmal attacks of pain starting in the right hypochondrium and radiating thence over the abdomen and through to the right scapula, with or without vomiting, collapse, or jaundice, are indicative of gall-stones. Tenderness over the gall-bladder, elicited either by gentle pressure or by a quick, deep jab with the ends of the

fingers, is an important sign. Cancer should be suspected where jaundice is persistent. If (as stated by Osler) it be dependent on gall-stones, ague-like attacks will probably occur.

In appendicitis the pain is often referred to near the umbilicus, but the tenderness is usually localized near McBurney's point. Not infrequently, however, appendicitis complicates cholelithiasis, the symptoms of one affection merging into or obscuring those of the other. In advanced cases of appendicitis a swelling in the right iliac fossa, with more or less rigidity of the right rectus muscle, is often found.

In right renal colic the associated urinary symptoms, frequent micturition, pain radiating from the back, down the right genito-crural nerve into the testicle, are diagnostic. The use of the Harris urine segregator, thus obtaining the urine separately from each kidney, and then making a careful chemical and microscopical examination of each specimen, may be resorted to in cases of doubt. It will enable one to determine the condition of the right kidney. The *x*-ray is valuable in locating stones in the kidney. Leonard, of Philadelphia, claims to be able to determine their presence by this method in about 95 per cent of cases. The value of the *x*-ray in locating gall-stones is very questionable.

I have made repeated experiments with quite a number of biliary calculi of at least four varieties, viz., the small black stone, the common yellow variety, the large dark-brown variety, and the clay-colored calculi, to determine the diagnostic value of the *x*-ray. I found in each case that the gall-stone *did not cast a darker shadow than the surrounding muscles.* My experiments thus far have been with the fluoroscope only. As a result of these observations I believe it would be practically impossible in the majority of cases to definitely and absolutely determine the presence of biliary calculi with the *x*-ray. There may, however, be some varieties that cast a darker shadow than those I have tested. (I am indebted to Dr. H. D. Niles for several of the specimens used in these experiments.)

In malignant diseases the presence of a tumor, the absence of pain, or when present its continuous character, the absence of fever, the gradual and persistent loss of flesh and strength, and the cancerous cachexia, will usually suggest the character of the affection. In some cases, however, gall-stones coexist with carcinoma, as in a case of mine, a lady aged 60 years, who had cancer of the pylorus complicated with cholelithiasis. In this case there was present a tumor in the epigastric region (at first very obscure), slight icterus, and

bile in the urine, an absence of HCl in the stomach contents, with more or less continuous pain or discomfort.

Acute dyspepsia with flatulency is usually easily differentiated by the history of some manifest cause, the absence of serious symptoms, and the fact that the pain and tenderness is limited to the area of the stomach. A careful analysis of the contents of the stomach after an Ewald or Hemmeter test meal will demonstrate the condition of the gastric secretions.

In a case of mine, a man aged 55 years, in which operation showed adhesions of the lower end of the stomach to the gall-bladder, the patient suffered severe cramping pains, causing him to bend over in order to secure relief. His stomach was dilated, and he occasionally vomited large amounts of a dark-brown fluid resembling the vomitus usually found in carcinoma of the stomach. Obstinate constipation was also one of his symptoms.

In lead colic the more or less constant stomach-ache, the constipation, and blueness of the gums, will usually suggest the diagnosis.

The rational treatment of gall-stones is removal by surgical procedures. In prescribing prophylactic measures one may recommend the avoidance of tight lacing; temperance in diet, warm baths, fresh air, and plenty of regular, systematic out-of-door exercise. The excessive use of sweet or starchy foods should be avoided. A sufficiency of albuminoid and nitrogenous foods should be taken.

Alkaline saline waters may act beneficially by stimulating intestinal peristalsis and facilitating drainage of the bile-passages. Enemas of hot water act similarly.

No medicine as far as is definitely known at present can dissolve gall-stones in the body or produce any material benefit, except by alleviating symptoms.

While it is true that olive oil, oleic acid, and animal soap will partially dissolve gall-stones in the test-tube, there is no positive evidence that olive oil has the same effect in the body, as it is impossible for it to reach the stone in the bile tract.

Gastric lavage is helpful to relieve the severe vomiting and pain of hepatic colic, and sometimes works better than a hypodermic injection of morphine, although the latter will usually be required in severe cases.

W. J. Mayo has used the chloride of calcium as a prophylactic against postoperative hemorrhage in cases of gall-stones associated with jaundice.

The radical or surgical treatment of gall-stones consists of one or

more of the following operations, depending on the indications: (1) Cholecystostomy, (2) cholecystectomy, (3) choledochotomy, (4) cholecystenterostomy.

W. J. Mayo, whose experience in this field of operative surgery is very extensive, and who reports in the *Annals of Surgery* for June, 1902, an analysis of 328 operations upon the gall-bladder and bile-passages, gives his mortality as only 2½ per cent in benign cases, and 18 per cent in those associated with malignant disease.

The incision usually made is a straight one through the rectus muscle. This may be enlarged as required. Bevan's incision is a good one. Robert Weir recommends incising the sheath of the rectus and the deeper muscles obliquely and retracting the rectus, rather than severing it.

J. B. Deaver and others place a pad under the back to elevate the liver before making the incision. In cases presenting much difficulty in exposing the gall-bladder W. J. Mayo recommends dividing the peritoneum, binding the gall-bladder to the liver, and separating the cellular space between, thus facilitating the mobilization of the parts. Gauze packing will usually check the venous hemorrhage thus produced.

Roswell Park, reasoning from the analogy between the appendix and the gall-bladder, recommends cholecystectomy in quite a number of cases. W. J. Mayo believes it is the proper procedure in a large percentage of cases in which the cystic duct has disturbance of its structure and mechanism, either by stricture, valve formation, or other unfavorable conditions that prevent proper drainage of the gall-bladder. Cholecystectomy is contraindicated in cases of infective cholangitis or obstruction of the common duct from any cause. In these cases cholecystotomy or cholecystenterostomy is indicated.

Mixter's method of drainage is a practical, convenient one, and was used on a patient of mine (operated by Dr. H. D. Niles and myself) at the Holy Cross Hospital. After making the usual abdominal incision, and walling off the peritoneal cavity with gauze, the gall-bladder was secured by passing two ligatures through its walls, these being used to anchor it in position. It was then incised, a large gall-stone removed, a purse-string suture was placed around the distal end of the gall-bladder, a glass drainage-tube flanged at the proximal end, about three-eighths of an inch in diameter and six inches long, was inserted, and the purse-string ligature tightened around the tube. After suturing and dressing the wound a rubber drainage-tube about three feet long was attached to

the glass drainage-tube, and the bile allowed to drain into a vessel at the side of the bed.

W. J. Mayo's operation of dissecting out the mucous membrane of the gall-bladder is an ingenious one, but seems to be open to the objection that only a portion of the disease is removed, as islands of mucous membrane penetrate into the muscular tissues, and round-cell infiltrates extend beyond the mucous layer. This fact was recently demonstrated by Emil Ries, of Chicago, who recently wrote his investigations in a paper entitled "Cholecystectomy versus Removal of the Mucous Membrane of the Gall-bladder." Kehr reports excellent results from cholecystectomy, his mortality in over 100 cases being about three per cent.

J. B. Deaver, of Philadelphia, favors this operation in properly selected cases. In a case of biliary calculi, operated at the German Hospital, in June, after exposing the gall-bladder he made an incision through the peritoneal coat parallel with the long axis, and then did a subperitoneal enucleation. He protected denuded areas by the use of the Cargill animal membrane.

In performing cholecystenterostomy, W. J. Mayo usually uses the Murphy button, and where he finds it difficult or impossible to make the anastomosis to the duodenum he uses the transverse colon.

Choledochotomy is the name given to the operation of incising the bile-ducts for the extraction of gall-stones, in cases where the calculi cannot be otherwise removed. The operation is a difficult one.

Courvoisier performed on January 22, 1890, the first successful choledochotomy. Kehr collected reports of 84 cases with a mortality of 37.8 per cent. In his own practice, however, the death-rate was only about 10 per cent. Fenger has reported 7 cases, with one death—14.3 per cent mortality.

Robson operated 21 cases with a mortality of 23.8 per cent. W. J. Mayo reports 31 cases of choledochotomy operated, with one death.

Robson describes the operation of choledochotomy as follows:

"The cholecystotomy incision must be extended to four or five inches, and after the separation of adhesions the wound must be held open by a retractor on the right, and preferably by an assistant's finger on the left, as the fingers can at the same time retract the pylorus and stomach on the left, and the colon and omentum below, without inflicting injury, as retractors are apt to do. An oblique incision through the parietes along the lower border of the

right lobe of the liver gives more room than the vertical incision where the common duct is to be explored; but by lengthening the vertical incision and having the edges well retracted ample room is obtained. The assistant who is using the retractor on the right may with advantage use his left hand to draw upward the overhanging liver and costal margin. A sand-bag placed under the lower dorsal spine makes the region of the common duct more accessible by bringing it several inches nearer the surface.

"The operator should now, after having separated adhesions, have a good view of the common duct within the free border of the lesser omentum, and on inserting his left index-finger into the foramen of Winslow, or on grasping the duct between the index-finger and thumb, he can without difficulty bring the duct well within reach, the concretion making a distinct projection.

"Over the prominent stone, a vertical incision as low down and as far forward as possible should be made, sufficiently large to allow the concretion to pass. Through this opening a probe can be passed, or even a finger, in order to explore the ducts thoroughly, so as to remove other stones if present.

"To leave a small concretion may invalidate the operation, since, as Courvoisier, and later Fenger, have shown, a small gall-stone may by its ball-valve action occasion repeated attacks of pain and jaundice.

"It is of the utmost importance to clear the ducts, or operation will be futile, as shown by Kehr, who left concretions behind in 16.6 per cent of his cases, and by Riedel, Terrier, Fenger, Lauenstein, Kuster, and others. Fenger has suggested a flexible metallic probe, which, he says, will give a click when it touches a stone, or which will produce a grating sensation when it passes one. This we know by experience to be a fallacious guide, as after careful probing, and even passing a scoop into both hepatic ducts and up and down the common duct, without feeling a calculus, a finger inserted through the incision felt a stone, which was then removed; but had we trusted to a probe the calculus would have been left. The duct is usually dilated sufficiently to permit digital exploration, which under such circumstances we should always advise, reserving a bent probe, or, better still, a slender bent scoop, for use where the duct is not capacious enough for the finger. The hepatic duct and its primary branches can be readily explored and calculi removed from them through an incision in the common duct.

"The incision in the duct may now be closed by interrupted sutures in two layers, first the muscular and fibrous coats being

approximated, and secondly the serous margins; but if this be impracticable, the muscular and serous coats may be sutured together, and additional Lembert sutures may be applied over all.

"A rectangular cleft-palate needle is a most convenient instrument to employ in applying these deep sutures, though doubtless a small circular intestinal needle and holder will answer equally well, or the special needles and holder suggested by Mr. Lane may be found more convenient.

"If a gall-stone be found in the hepatic duct, it may be reached by opening the common duct, and passing a scoop or forceps through this opening.

"Dr. Elliott recommends the application of the sutures before removing the stone. This is certainly an advantage, though if the ducts have to be explored afterward the sutures are rather in the way. The same advantages may be obtained by introducing the two end stitches before extracting the calculus, as when they are drawn on the edges are approximated and more easily sutured.

"Professor Halstead advocates (*Johns Hopkins Hospital Bulletin*, 1898) the use of a small hammer which he has devised for facilitating the application of sutures in the repair of the common bile-duct. By expanding the duct and drawing it toward the surface, it not only temporarily blocks the passage, but allows the sutures to be accurately applied.

"A large drainage-tube with a gauze drain in it should be left in the abdomen and brought out through a lumbar stab wound, and it may be wise to gently pack iodoform gauze over the duct, and to bring the end out by the side of the drainage-tube, if there be any doubt about the closure of the wound in the duct. The tube may be removed in twenty-four to forty-eight hours if there be only a little discharge, and the gauze should be gradually removed day by day until it is all away."

DEDUCTIONS AND CONCLUSIONS.

In conclusion I wish to briefly summarize and emphasize the following points:

1. Gall-stones are of more frequent occurrence than is usually supposed.

2. A large number of cases treated for chronic stomach trouble are victims of cholelithiasis.

3. Tenderness at a point half-way between the right costal cartilage and the umbilicus, elicited either by gentle pressure or by a

quick jab of the points of the fingers, is an important diagnostic symptom of cholelithiasis, or cholecystitis.

4. A proper regulation of hygiene, diet containing a large percentage of albuminous or nitrogenous food, abundance of outdoor exercise, and the use of plenty of pure water, are the best prophylactic measures.

5. The rational treatment of gall-stones (after they have formed) is their removal by surgical measures, as there is no internal medicine that can be relied upon, although some remedies may be palliative.

6. There is an analogy to some extent between inflammation of the gall-bladder and appendicitis.

7. The best time to operate is after the acute attack has subsided, unless symptoms of sepsis demand immediate surgical intervention.

8. The *x*-ray is not as valuable an aid in locating biliary calculi as it is in diagnosing stones in the kidneys.

9. The operation of cholecystectomy is being more extensively used than formerly, and the results reported have been favorable.

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NEPHRITIC EYE LESIONS.

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Of the morbid ocular changes in kidney disease, there is none of greater clinical importance than that commonly designated "albuminuric retinitis." This condition manifests itself in more than 10 per cent of the cases, and, when typical, forms a symptom of diagnostic value second only to urinalysis. Moreover, as a prognostic factor its presence is a matter of paramount interest.

The other ocular manifestations of renal disease, while less pathognomonic than that just suggested, are of more or less importance, and their brief mention appears to be warranted.

There seems to be no vascular structure of the eye that may not at some time during the course of the malady be the seat of renal involvement. Besides the retina, the conjunctiva, the uvea, the lids, and even the external ocular muscles may show signs of remote pathological processes, directly or indirectly attributable to the nephritic condition. Swelling of the eyelids, particularly the lower ones, is a symptom so suggestive of renal trouble as to invite consideration in this connection by not only the profession but the laity as well. It is, at times, an early symptom of acute Bright's disease, in which case the edema is likely to be transient; it is also met with in the late period of chronic nephritis.

Chemosis, or swelling of the conjunctiva, is sometimes observed in connection with nephritis, and its presence, when unaccompanied by severe local inflammatory processes, should lead to careful examination of the urine.

Recurring subconjunctival hemorrhages in persons over forty years of age should be looked upon with suspicion. The hemorrhages occur suddenly, the patient oftentimes awaking in the morning to find a deep red blotch clearly outlined upon the white scleral background. The ecchymosis clears usually within a few days, and there may be no further extravasation for several weeks or months. This symptom I believe to be one of considerable import, and in a number of instances it has proven the presence of chronic nephritis, hitherto unsuspected.

Primary iritis occurs in a number of cases, and where no syphilitic or rheumatic history can be clearly demonstrated, renal disease may be looked for. Von Michel, as the result of investigations to determine the causation of primary iritic inflammation, found in eighty-four cases that over one-third had chronic nephritis.

Paresis of the several extrinsic ocular muscles, due to sclerosis

of the nerves, or to a hemorrhage at their origin, not infrequently occurs in the final stages of chronic renal inflammation. The strabismus is apt to be transient and recurrent.

Diminution in the power of accommodation in those past middle life, requiring frequent change of glasses for near work, is a symptom of kidney disease well advanced, and should lead in every instance to a chemical and microscopic examination of the urine.

The connection between cataract and kidney disease is a matter upon which observers are not fully agreed. Becker, who gave the subject much study, consulting the records of 250,000 autopsies, concludes that while cataract may occur with renal disease, it cannot be held to be the result of the malady.

Of far greater consequence, however, than any of the manifestations just mentioned are those intraocular lesions so clearly demonstrable by the ophthalmoscope, and which, when noted, form collectively a group of symptoms so pathognomonic as to rank among the most exacting signs in scientific medicine. The changes commonly met with consist of retinal edema with dark-red hemorrhages, white patches arising from fatty degeneration of retinal fibers and areas of exudation, dilated and tortuous veins, and in most instances a swollen nerve-head. These lesions are usually seen contemporaneously and constitute the commonly designated "albuminuric retinitis," or what may be more specifically termed "neuroretinitis nephritica." The condition is one which never appears before the renal affection, but after the disease is well advanced. The eye symptoms may, however, be the first to call attention to the general malady, and it is a common incident in the practice of every ophthalmologist to discover the first traces of kidney trouble in patients complaining only of failing vision. The diminution in the acuity of vision usually occurs gradually, the patient reporting his inability to see objects clearly—the terms "blurred" and "smoky" being used to describe the condition. The color sense remains unimpaired, the visual field is little, if at all, contracted, but central scotomata are the rule. Both eyes are generally affected, although not to the same degree. Unilateral Bright's retinitis is said to be not very rare, although in a rather large clinical experience I do not recollect ever seeing a case in which one eye remained unaffected for any length of time. Albuminuric retinitis may occur in any of the several forms of renal disease, but is found to be more frequently associated with the granular kidney or in primary atrophy of the kidney.

The course of the affection is variable, depending largely upon the renal disease. There may be periods of marked improvement,

and then again sudden exacerbations with greater or less degree of amblyopia. Blindness very seldom, if ever, results, death occurring before such a condition manifests itself.

In this connection is brought out one of the most important clinical facts in the consideration of this subject—*i.e.*, the prognostic significance of neuroretinitis nephritica.

To the oft-quoted statistics of Belt, who records 419 cases, of which 72 per cent died within one year, and 90 per cent in two years, may be added the combined statistics of seven other observers (*Archives of Ophthalmology*, January, 1902, p. 99), whose average rate of mortality within two years was 76 per cent, and my own cases, more than twenty in number, none of which has survived more than thirty months.

In reference to these statistics, it may be well to emphasize the fact that all cases of retinal disease occurring in the acute nephritis of pregnancy and the exanthemata, in which the prognosis is much more favorable, have been excluded.

These facts would at least tend to point out the very unfavorable prognosis of cases presenting this ocular lesion, and to direct attention to the importance of a thorough ophthalmoscopic examination in every case of suspected renal disease.

Uremic amaurosis, or more properly, nephritic amaurosis or amblyopia, is sometimes confused with albuminuric retinitis, but differs so clinically from it as to make the diagnosis clear to any competent observer. It is more commonly met with in the acute nephritis of pregnancy and scarlet fever, but at times developing in chronic renal inflammation during an acute exacerbation of the malady. The onset of the attack is usually rapid and accompanied by cerebral symptoms more or less pronounced, the patient oftentimes becoming blind within a few hours, the condition lasting from one to two or three days. In uncomplicated cases there are no ophthalmoscopic findings. The condition is one dependent entirely upon defective elimination, and may be looked upon as a true toxemia.

In treating of this particular subject, it has been my aim to point out the more significant ocular manifestations of nephritis and to allude to their clinical symptoms. In conclusion, I desire to strongly urge upon the general practitioner the importance of a more wide-spread employment of the ophthalmoscope as an aid to medical diagnosis, and a more comprehensive recognition of certain ocular symptoms, which in many instances are but the manifestation of morbid processes in organs far remote.

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PARALYSIS AND DAMAGE SUITS.

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The commercial spirit of the age has forced a new and arduous duty upon the man of medicine. The assessment of damages for settlement of claims for the immediate and remote consequences of personal injury has become one of the most common and acute of the duties of the medical as well as the legal jurist.

Our knowledge of the effects of trauma upon the nervous system has become more complete and rounded out by the observations of our medical predecessors, who, though often at fault because of hasty conclusions, left to us a heritage of facts, statistics, and observations which now enables us to complete the task which they found was not bounded by the horizon of one life. The optimist says all is to some good.

No book ever aided the malingerer as Erichsen's Spinal Concussion. It is equally true that no book was ever produced which caused so much controversy; and in controversy lies truth and discovery. The railway companies of the world fought its conclusions and expended large sums maintaining and encouraging the idea that *all* was fraud. But truth, even when half error, has remarkable vitality, and while the pathology of Erichsen is now obsolete and a majority of his conclusions rejected, yet considering the time of his work it was and still remains a remarkable and epoch-making book.

The undying zeal of controversy, stimulated by the best of medcal and legal talent arrayed on either side, has done much to elucidate, and is still doing much to clear up, the misty subject. That truth lies between the extremes seems evident from the decided modificatious of the views of some of the radical of both parties.

It is of interest to note that that new factor, born of commercialism and controversy—the Claim Adjuster—does not hesitate to recognize the morbid state (hysteria) as a result of traumatism, be the trauma slight or great, and to advise his employers to settle outside of court.

Medical men have been extremely reluctant to acknowledge that rare cases of paralysis (hysterical) were promptly cured by the self-styled "healers," whose nearest approach to purity was the 14-

carat gold pieces extracted from the deluded but deservedly grateful patient. Then why should we show surprise at the unbelief of our legal brother who witnesses the supposed paralytic (truly hysterical) forget his crutches in the exuberance of joy at winning his case and collecting his damages?

With few exceptions the medical man has come to recognize these cases, and no longer insults the patient or stultifies himself by crying *fraud.* But many railway surgeons have closed their eyes to the facts, and labor long to convince the world that a *traumatic neurosis* is but artful fraud, and its victim a shrewd malingerer of the deepest dye.

Railway surgeons as a class have made the mistake of not investigating these cases from the dispassionate standpoint of the neurologist, who has long known that these affections, while pathological frauds, are true clinical entities, and has demonstrated by undeniable statistics that the prognosis is much more grave than the railway surgeon would have us believe. Indeed, railway surgeons generally have been very slow to appreciate these investigations, but have been very quick to denounce them without due consideration. As evidence of this fact I wish to cite the case of the celebrated Freeman family, the story of which is told in a pamphlet that has been widely circulated among claim adjusters and railway surgeons, entitled "Paralysis as a Fine Art." Now I submit that any one who would advise or countenance the payment of one cent of damages to settle the claims of such self-evident, thinly-tissued frauds as this family of blackmailers has certainly not been very careful of his study of the nervous system in relation to the very important question of the detection of the malingerer. It is surprising that in the late book of Pearce Bailey on Accident and Injury he should call this pamphlet "interesting and cleverly written," implying his indorsement of the title of the pamphlet. If all examples of fine art were to be measured by such crude tests as seem to have been used in the examination of the various members of the Freeman family, I am quite certain that our amateurs need have little fear of sending their daubs to the Royal Academy. The whole pamphlet from beginning to end was evidently written by a man who knew almost nothing of hysteria, and very little regarding the organic palsies, or he would not parade the ignorance of his colleagues by chronicling in printers' ink the details of the examinations made to determine the question of organic injury, hysteria, or malingering.

The company's physician speaks of the case in the following words: "Tenderness to pressure and percussion over the lumbar

and dorsal vertebræ. Can't stand, half reclining posture, all of the time evidencing great agony. When I stuck pins into her feet and legs, and touched them with my hands, she declared she could not feel any sensation, and I could not surprise her into any painful expression."

We have in this report no determination of the condition of any of the sphincters, no adequate tests to determine their continence or incontinence; no tests or charts furnished showing the areas of anesthesia, no comparison made or attempted to determine the character of the anesthesia, whether central, spinal, peripheral, hysterical, or simulated.

Simulation can only become a systematized occupation or means of livelihood through the ignorance of the examining surgeon. Thorough, careful, painstaking investigation will invariably reveal the most artful malingerer. Oppenheim, Dana, Putnam, Bailey, and Knapp, and in fact all of the great men who have made a study of the traumatic neuroses, are convinced of this fact.

There seems to be on the part of various writers a very wide difference as to the frequency of simulation. The oldest writers, of whom Schultze is a type, regarded simulation as very common, but that was in the days when hysteria and neurasthenia were but little understood. On the other hand, Oppenheim, Putnam, Knapp, and others regard it as comparatively infrequent, Oppenheim placing simulation as low as four per cent. Of course this is not intended to apply to the exaggeration of symptoms so common to the hysteriac and neurasthenic, which we all know is constant not only in litigation but in non-litigation cases.

When confronted by a case similar to that of Fannie Freeman, what shall the surgeon do, and what must he know to determine the question, "Is she paralyzed or is she malingering?" The surgeon examining her said: "She complained of paralysis of motion and sensation from the waist downward, and an inability to control the bladder and rectum." "Tenderness to pressure and percussion over the lumbar and dorsal vertebræ" had little or nothing to do with the determination of this question. The fact that she said she could neither stand, walk, nor sit except when supported, and that she claimed to suffer agony during this process, is merely her personal statement and has nothing to do with the real truth of the proposition. The simple fact that she had sufficient control of her sensations to stand having a pin thrust into her feet and legs, and her bare statement that she felt neither punctures nor the touch of his hand, throws absolutely no light upon the question,

unless the areas over which the anesthesia and the analgesia existed are carefully mapped out, and placed in the class of anesthesiæ to which they belong—be it a stocking anesthesia of the functional type, a unilateral anesthesia confined to the peripheral distribution of a nerve, or the symmetrical bilateral anesthesia following the segmental type due to a lesion of a certain level of the cord.

Be this as it may, his prognosis was given as unfavorable, and Fannie got $450 and the surgeon his fee, and is probably still retained by the company that was mulcted by his lack of thorough examination. Now Fannie Freeman may have possessed an unfaltering will. She may have possessed, like many degenerates of her class, a degree of analgesia which is more or less common among degenerate females, and sufficient to have never been surprised into an expression of pain by pin-thrusts, but she certainly did not possess the knowledge nor power to defeat the result of some certain tests in relation to the sphincters, reflexes, circulation, and sensation. Had the anus been exposed to a strong light, and, without her knowledge as to what was to be done, a feather quickly stroked over the skin about the anus, she would certainly and invariably have manifested a distinct contraction of the levator and sphincter muscles, demonstrating the falsity of her assurances that her rectal sphincter was incompetent. If this test fails, the finger without anointing should be quickly thrust into the anus, when neither she nor any one else, however great their will power, could prevent the contraction of the sphincters upon the intruding finger. If the paralysis is actual, the laxity of the sphincters will demonstrate the fact beyond cavil. If the examining surgeon had carefully counted her pulse previous to palpating her tender spine (?) her pulse-rate would have been accelerated if her statements were facts. He should have seated her in a good light and watched closely the pupils, which would almost certainly have dilated if pressure on her vertebræ gave her much suffering.

A paraplegia or a paralysis of the lower limbs without loss of bladder or rectal control is almost invariably due to hysteria or simulation. When the simulator insists that his bladder and rectum are paralyzed, he renders his case particularly susceptible of detection. We find nothing in the description of Fannie Freeman's case as to whether it was demonstrated that her clothing or the bed upon which she lay was saturated with the urine of an incontinent or overflowing bladder. We find nothing to tell us whether a catheter or bulbous sound was used to determine if the vesical sphincters contracted upon them.

Unfortunately for the money-loving Fannie, upon her next attempt to mulct the railway company they sent the same physician that had examined her before, who, to use the words of the pamphlet, "this time recognized the fraud, notwithstanding her persistent assurances that this was her first accident."

The subject of the detection of the malingerer is so extremely wide that it is impossible to compass its discussion in this paper. The few remaining remarks will be made in an attempt to show how, by systematic examination, it is always possible to detect one who simulates a spinal paralysis. This seems to be the most frequent form of paralysis that the simulator attempts. *To sham a pathological sham is a great undertaking.* Besides, if it is sham, why not sham the real thing and not its pathological counterfeit—hysteria? It requires no mean order of mind to be a successful malingerer. It requires no small amount of medical knowledge to be able to imitate a paraplegia of spinal origin, but I am satisfied that to be a successful malingerer and imitate a hysterical neurosis requires a mind and a knowledge almost beyond conception.

Given a malingerer with great self-control, power of imitation, and thorough knowledge of the symptoms of a genuine lesion of the spinal cord, and yet he cannot deceive a careful examiner. He might be able to feign areas characteristic of a lesion of a certain spinal level; he might cause grave doubts to arise in the mind of the examiner as to the integrity of his vesical and rectal sphincters; but he could not control the ascent of the testicle when the scrotum or skin of the inside of the thigh was smartly pinched, and it would be almost impossible for him to prevent muscular contraction incident to an unexpected titillation of the soles of the feet. (Of course, it is understood that during this examination he is blindfolded.) Neither could he give any sort of imitation of increased knee-jerk, and least of all ankle clonus. The most assiduous practice will not admit of any one producing the rhythmical to-and-fro movement of an ankle clonus that must develop sooner or later in a patient who has suffered a transverse lesion of the cord.

It is my belief that a thoroughly posted, intelligent person is not liable to attempt to simulate such a paralysis. Simulators are usually of a lower order, though frequently possessing a high degree of low cunning. Although the Freeman girl knew enough to simulate loss of sphincter control, her knowledge did not admit of her feigning the areas of anesthesia which should have accompanied a lesion that would destroy the sphincters (it will be remembered that she claimed that her anesthesia extended below the knees).

The fact of the sphincter involvement would also militate against the functional form of palsy which might manifest itself by the paralysis of her legs and the stocking form of anesthesia which she simulated. Sphincter paralysis does not occur in hysterical paraplegia. Her case is but an illustration of all of them. They are unable to present a complete picture of the disease they are simulating, whether it is a paralysis in fact or a pathological counterfeit (hysteria).

I can conceive of a bright person quite successfully imitating a hysterical paraplegia, but in these cases, with the examination of the eye fields for the detection of narrow fields for color which are so common in hysteria, the examination of other portions of the body for undiscovered areas of anesthesia, and finally, a search for a sign which I have called attention to and have named hysterical muscular paradox, I feel quite sure that even this simulator would be detected in his simulation, and properly denounced as a fraud.

612 PROSPECT STREET.

BOOK REVIEWS.

GENERAL PARESIS, PRACTICAL AND CLINICAL. By Robert Howland Chase, A.M., M.D. Philadelphia: P. Blakiston's Son & Co. 1902.

The work opens with certain postulates which are said to be uncontradicted: (1) The disease is invariably progressive; (2) its action on the brain and cord is very slight in the early stage and difficult to detect; (3) it rarely affects a large part of the brain or nervous system suddenly; (4) it affects first the highest intellectual and motor arrangements, which is followed necessarily by an impairment of the associated phenomena; (5) in whatever manner the symptoms may differ in the beginning, depending upon the region of the cortex involved, and however much they may vary in mode of onset, progress, and duration, toward the end of the disease they are markedly similar.

To state that the above dicta are beyond contradiction is to affirm their universal application. The text of the book in many cases refutes them, and few who have had a wide practical experience with the disease will admit their applicability within the dogmatic lines laid down. If the writer had stated that this disorder in most cases presented such a general type as is here set forth, and progressed in a certain fashion, we could have agreed with him. The beginner in opening the book, and chancing upon certain statements of this kind, will accept them in their entirety and be governed by them. As insanity has important forensic relations they may be quoted from the witness-stand as infallible dogma. If there is one thing more than another that puzzles the diagnostician it is the protean character of the symptoms that mark the onset of paretic dementia. Its course and duration are markedly varied, so that even the skilled diagnostician should not be chagrined if he fails to recognize the disease in its incipiency, or even mistakes its classification in the more developed forms.

It is evident that the author has obtained his knowledge of the disorder largely from asylum patients, in whom the disease is so far advanced at the time of commitment that they have many features in common. To obtain an adequate idea of paretic dementia, one must have had experience not only within the walls of an institution devoted to the care of the insane, but also in our large clinics for nervous diseases. The type of the disease which pursues its entire course outside of an asylum is very different from that which is found within the walls of an institution. The motor and paretic symptoms are often pronounced, while the psychical disturbance, though generally recognizable, never dominates the picture. A large number of cases of general paresis never see the inside of an asylum.

Notwithstanding these limitations, the author has given us a readable and adequate presentation of the disease largely from a clinical standpoint. He discusses all of its varieties and manifestations in detail. Throughout the work there are a large number of case histories taken from the literature, which illustrate certain types and special features of the disorder.

In the matter of recovery in this disease, the writer begs the question. While it is stated that cases have recovered, the inference to be drawn from his remarks is that these were probably cases of prolonged remission, or were

mistakes in diagnosis. The same begging of the question is often noted in malignant disease generally. The case of pernicious anemia, malignant growth, or infectious endocarditis remains with the diagnosis unaltered if the patient dies, but if he recovers there must have been a mistake. It is probable that a few patients who have general paresis recover.

THE NURSE'S GUIDE FOR THE OPERATING-ROOM. By Nicholas Senn, M.D., Ph.D., LL.D., C.M. Published under the Direction of the Sisters of Charity, St. Joseph's Hospital. Chicago, Ill.: W. T. Keener & Co. 1902.

The text of this book is made up of abstracts of lectures delivered by the author to the pupils of the training school of St. Joseph's Hospital. Its purpose is, as stated in the preface, to instruct the nurse in as concise and thorough a manner as possible in regard to the details of her duties before, during, and after operation. The technique of asepsis is given a prominence commensurate with the importance of the subject. The most important wound complications are mentioned and briefly described, so that the nurse may recognize them and give timely warning to the attending surgeon. Formulæ for the most reliable antiseptic solutions in common use are given. In giving directions for the more important major operations, a list of instruments and kind of ligatures, sutures, and dressing material are stated.

Of the numerous works for the purpose of teaching nurses their duties, this is the best. It is clear, concise, and does not attempt to teach the science of medicine, which is the defect in so many nurses' guides. It deals only with the duties of the surgical nurse. The directions are clearly expressed, and the nurse who has not had thorough hospital training could with the aid of this work make satisfactory preparation for an operation.

A TEXT-BOOK OF SURGICAL PRINCIPLES AND SURGICAL DISEASES OF THE FACE, MOUTH, AND JAWS. For Dental Students. By H. Horace Grant, A.M., M.D. Price, $2.50. Philadelphia and London: W. B. Saunders & Co. 1902.

This small work of 231 pages contains a brief exposition of surgical principles, and a special account of diseases of the face, mouth, and jaws. The work opens with a chapter on bacteriology, in which are stated some so-called basic principles of surgery which will not meet with general acceptance. The basis of surgical pathology is said to be germ infection, and consequently the study of this subject becomes that of bacteriology. We are prepared to admit the immense importance of bacteriology, especially in surgical technique, but to say that it comprehends all there is of surgical pathology is going too far, and is, in fact, a negation of the cellular pathology. It is a statement of the subject which attributes everything to the parasite and nothing to the host. In a summary the author says: "We find, in looking over the facts just stated, that the primary cause of all surgical diseases is the presence of colonies of germs, for which the general term is bacteria." Among the special diseases, such as harelip, dentigerous cyst, brachial cyst, angioma, adenoma, and various other pathologic conditions, the writer should have found some that are clearly not due to germs.

In spite of the want of clearness in the statement of surgical principles, the writer has gathered together a good deal that is of interest to the student of the

diseases and anomalies of the teeth. He discusses tumors of the mouth and jaws, involvement of the maxillary sinuses, neuralgia, inflammations of the mouth, and anomalies of development.

THE PRACTICAL MEDICINE SERIES OF YEAR-BOOKS. Under the General Editorial Charge of Gustavus P. Head, M.D. Volume I, General Medicine, Edited by Frank Billings, M.D., and J. H. Salisbury, M.D. Chicago: The Year-book Publishers, October, 1902.

The first volume of the second series is before us. It comprises 358 pages and shows a marked improvement over the former series, in that a higher calendered paper has been used, which, while occasionally giving a little reflection, after all shows a clearer letter and admits of a satisfactory reproduction of illustrations. This volume deals with the diseases of the respiratory, circulatory, blood, and blood-making organs. There is a chapter on the general infectious diseases, metabolic diseases, diseases of the ductless glands and of the kidneys. In his introductory note Dr. Billings says: "The ideas expressed by the authors of papers upon subjects which are not fully understood, or upon which there may be a difference of opinion between good men, are not necessarily acceptable to the editors. Therefore we hope our readers will look upon the Year-book as a *résumé* of the literature on general medicine of the year, the matter being selected by the editors because of its importance in discussing the known and unknown questions of medicine."

ESSENTIALS OF THE DISEASES OF THE EAR. Arranged in the Form of Questions and Answers. By E. V. Gleason, S.B., M.D. Third Edition. Price, $1.00. Philadelphia and London: W. B. Saunders & Co. 1902.

This book has been written mainly for physicians who desire to take a postgraduate course in otology. It opens with a description of the anatomy of the ear, which is about as unsatisfactory as any portion of human anatomy can be which depends merely upon verbal description and a few cuts showing a transverse section of the organ *in situ*. The best that we have seen is the one shown in Fig. 20, taken from Czermack. The directions for testing the hearing are accurate and more complete than some we have seen in larger works upon diseases of the ear. The methods of recording the hearing are given, together with the usual diseases of the ear and the accessory cavities. On the whole it will be found to be a most satisfactory work for undergraduates, or practitioners who desire to gain some systematic knowledge of the ear and its diseases.

LEADING ARTICLES.

MODERN METHODS OF SEWAGE TREATMENT.

At the last meeting of the American Association for the Advancement of Science, L. P. Kinnicutt delivered a valuable address on the modern methods of sewage disposal. This subject is one that should appeal to the residents of Northern Illinois, and specifically to the citizens of Chicago, who have, with little regard for modern advances in sanitary science, spent many millions in continuing a method of sewage disposal which is now quite generally condemned. The pollution of our streams and waterways will not long be tolerated when other means are at hand for the disposal of sewage.

At the outset of his address, Professor Kinnicutt defined sewage as the water-supply of a city, after it has been used. The total amount of waste matter contained in sewage varies, but on an average there is about seven pounds in one hundred gallons. There are approximately 150,000,000 bacteria in a liquid ounce. The earliest method of sewage disposal was to carry it into the ocean, or into the nearest stream. This method is allowable for cities situated on the sea, or on rivers whose flow is very large and the unfiltered water of which is not used as a water-supply.

There are six principal processes in the disposal of sewage. In their historic order they are: sewage farming, chemical precipitation, intermittent filtration, contact bed treatment, septic tank treatment, continuous filtration.

Sewage farming is based on the idea that plant life in itself is capable of decomposing the complex matters contained in sewage, and that its capacity to do this work is almost without limit. Consequently it was thought that sewage could be applied continuously to cultivated land, and if vegetation was not drowned, not only would perfect purification take place, but an immense profit could be derived from making use of the polluting substance for plant food. It is now well known that plant life cannot assimilate the organic matter of sewage unless it is first decomposed by bacteria, and sewage farming has resulted in failure except in those few cases where the land was of an exceptional character and of large area compared to the population to be served, as one acre to fifty persons. The Paris sewage farms, of which so much has been heard, are far from being a success.

The chemical precipitation method consists in adding certain chemicals, usually iron and lime sulphate, to the crude sewage, allowing the sewage to run into large open tanks through which it slowly flows. The solid matter is deposited, and the supernatant, clear liquid contains only the soluble substances in the sewage. This method is costly, averaging between forty and fifty cents per year per head of population. The amount of organic matter removed is about 55 per cent. The clear liquid after precipitation will putrefy and cannot be emptied into a stream where the flow is less than ten times the volume of the sewage. The precipitate is difficult to treat, and if it cannot be carried out to sea and dumped, as in the case of the sewage in London and Manchester, it must be pressed, and then be either carried away to some unoccupied and valueless land or burned.

Both sewage farming and chemical treatment are now considered obsolete methods. All of the more modern methods of treatment belong to the so-called bacterial processes.

Intermittent filtration was advocated as early as 1865 by Alexander Miller, who showed that by passing sewage intermittently through sand the obnoxious substances were removed. It is now known that these changes are brought about by bacteria. All that is necessary to destroy organic matter in sewage is to provide conditions favorable to the action of bacteria. Such conditions are obtained by allowing sewage to flow upon a bed of sand for a period of six hours out of the twenty-four. By such a method, from 50,000 to 75,000 gallons of ordinary sewage can be cared for on each acre of sand bed in twenty-four hours. The liquid that runs away from such beds is clear, bright, and almost odorless. It can be emptied into a stream without causing trouble. This method is only possible where there is an abundant supply of sand. In cases where it is necessary to bring sand from a distance and construct the beds, the cost is too great. The investigations started by this economic problem show that two varieties of bacteria are necessary—the anaerobic and the aerobic. Instead of allowing the sewage to flow directly upon the bed of sand, it is first subjected to the anaerobic bacteria in a septic tank. This is only a modified cesspool. Such a tank may be open or closed, and the sewage is run into it continuously, but at so slow a rate that it requires from twelve to twenty-four hours to pass through the tank. In such a tank anaerobic bacteria increase enormously, and act upon solid and liquid substances in the tank, bringing about those changes which are grouped under the name of putrefaction. The putrefaction

changes a large amount of the polluting substances into liquid or gas. Wood fiber and paper are broken down into simpler substances, and nitrogenous matters are liquefied. Gases are evolved equaling about one cubic foot for every hundred gallons of sewage passed through the tank. Such gas contains 76 per cent of marsh gas and can be used for illuminating purposes. The septic tank treatment of sewage removes about 50 per cent of the putrescible substances contained in the sewage, almost as much as is accomplished by the chemical process. Where the sewage contains a large amount of manufacturing wastes in which there are chemicals which act as germicides, the septic tanks cannot be used.

The septic tank, removing as it does half of the impurities, reduces the amount of sand area required for the purification of sewage. By the intermittent filtration process, where the anaerobic and aerobic bacteria are working side by side, only a limited amount of sewage can be purified upon a given sand area, but where there is a preliminary treatment of the sewage in the septic tank, about five times this amount can be treated on the same area.

The contact bed treatment differs from intermittent filtration in that the sewage, instead of being applied slowly and being allowed to drain through a bed of sand, is run rapidly into a water-tight bed filled with coarse materials such as cinders, coke, or broken stone, and retained in the bed for a number of hours. This process is not adapted for treating crude sewage, as the action of the bed is intended to be aerobic, and the idea is to fill the bed as quickly as possible, usually in one-half hour, with septic tank or chemically treated sewage. The bed is allowed to remain full of liquid for two or three hours. It is then emptied in the same time as was required for filling. The same bed can be used but twice, or at most three times, in the twenty-four hours, and if it is kept in good condition it must be allowed to remain idle one day in seven. Working in this way, about 500,000 gallons of sewage can be purified on one acre of contact bed per day. The action of a contact bed depends upon the presence of aerobic bacteria. If the filling material of a contact bed in active condition be examined, every individual piece is seen to be coated over with a slimy growth, which if removed and dried cuts like jelly. Under the microscope the slime is found to be composed of bacteria. The contact bed method is a successful means of disposing of sewage which has been previously treated by a septic tank, or by chemical process. It solves the problem of sewage purification in towns and cities where large areas of sand are not available. Its successful operation

requires the personal oversight of a well-trained sanitary chemist, or engineer.

Continuous filtration is an attempt to still further increase the amount of sewage that can be treated on a given area. The method is based upon the idea of supplying air to the filter at the same time the sewage is being run onto it. The filter is of such construction and so drained that fresh air continuously remains in it, and there is no necessity of periods of rest such as is required by the intermittent contact bed methods, the only object of such periods of rest being to supply air to the bacteria. The supply of air is furnished by blowing the sewage upon the sand in the form of a fine spray, so that each drop of liquid will be surrounded by air as it enters the filter. In addition, air is retained in the filter by making its construction so open and having it so thoroughly underdrained that the liquid cannot fill up the interstices. From a mechanical standpoint it is difficult to construct an apparatus that will properly spray the liquid upon the filter, and there is an additional difficulty in constructing one that will remain sufficiently porous to furnish an abundant supply of air and at the same time retain the sewage a sufficient time for the bacteria to act upon it.

Continuous filtration has certain merits, the most important being that it admits of the treatment of large quantities of sewage on a given area, but it is a process that requires a great deal of attention. These filters will not work satisfactorily in very cold weather. The author sums up the present status of the sewage problem as follows:

Sewage farming as a general method of sewage treatment is not practicable and seldom possible. Chemical treatment only removes a part of the polluting substances in the sewage. It is a partial or preliminary treatment advisable only in cases where sewage contains germicidal substances preventing the use of the septic tank. Intermittent filtration is the best method of treating sewage in cities where sand can be easily and cheaply obtained. The septic tank process is a most valuable adjunct, and almost an essential part of all bacterial methods of sewage treatment.

EDITORIAL COMMENT.

ORIFICIAL SURGERY IN RELIGIOSITY.

The great apostle of the Orifices, whose philosophy fungus-like flourished for a time, who later blossomed out as an osteopath under the Kirksville vision-seer, now appears as a servant of a California religious cult of the Cybele-Skoptzi type. Excess of spirituality, as Spurgeon pointed out in a sermon more than two decades ago, is by a strange yet natural law next-door to sensuality. Sensuality, as Montaigne remarks in one of his essays, ever seeks stimulation even in pain. From these two factors arose the mutilation of the Cybele and Dionysiac cults, and of those early Christians of whom St. Matthew speaks when he says many have made themselves eunuchs for religion's sake. Origen, the theologian, was one of these last. The Montanists were a sect who carried asceticism to an extreme of this kind. The two great modern types of these sects occur in Russia and in California. The Skoptzis, the Russian representatives, were so called in ridicule. Skoptzi means gelders. They call themselves the "White Doves." They arose in an epidemic of flagellation which cropped up about 1757. Sseliwanow, their leader, was at first sent to Siberia, and later to an insane hospital. Czar Alexander I. transferred him to a general hospital, where he converted the Councillor of State Jelansky, who set him free. The Skoptzis spread through Russia, and their adherents were to be found at court. Their chief argument is the nonconformity of orthodox believers (especially priests) to doctrines professed. They contrast the lax morals of these with the chaste lives, abstinence from alcohol, and continual fasts of the "White Doves." Castration is performed by them at one stroke or at two different times. In the former case one cicatrix was left and in the other two. The greater number (those of the "first purification," conferring upon them the "lesser seal") have lost testicles and scrotum. These have lost the "keys of hell," but retain the "key of the abyss" (the female genitals). The most perfect (worthy of "riding the white horse and bearers of the imperial seal") are deprived of penis, testicles, and scrotum. Hot iron, pieces of glass, old wire, sharpened bone, and old razors are used in incision. As might be expected, shock is rare among these fanatics, hence deaths from the operation are uncommon. The "first purification" does

not destroy the sexual appetite. According to Liprandi, some of those thus "purified" are veritable satyrs. Women of the order are mutilated in the external genitals, the mammæ, and nipples. Fire and caustics (*Progrès Médical*, Dec. 23, 1876) are applied to the nipples during the first act of the ceremony. The second act is ablation of one or both breasts. The third consists in gashing the breast. Resection of the nymphæ or of the nymphæ and clitoris and of the superior labia majora constitutes the fourth act. The cicatrices resultant deform the vulva.

As according to "orificialism" the orifices of the body are the great source of human ills, it is hardly surprising to find its chief apostle installed in the rôle of a Skoptzi sacrificial priest to the California cult. There is such a flavor of sadism about orificialism that it naturally finds its acme in sadistic religiosity. Fortunately in this field it destroys reproductions of that fanatic egotism which procreates most degenerates. While these procedures might be reached, as against public order, through the ordinary criminal code of California, evidence would not be forthcoming, and suits for malpractice would be barred by the element of consent. The Pacific Coast seems to be usurping the rôle of Massachusetts in the creation of queer sects. A few years back, the wife of Grant's attorney-general formed an Eddyite sect whose chief tenet was that microbes were imps and the appendix vermiformis was the devil, but that physicians in removing the appendix were guilty of sacrilege since the day of judgment had not come. The apostle of the California Skoptzi, while not submitting to the "first purification" herself, refers applicants to the great orificialist.

RADIOACTIVE BODIES.

The extensive employment of the *x*-rays in medicine, both in diagnosis and treatment, makes any observation on the method of their production of interest to medical men. It is only about two years since the so-called Becquerel ray was described. This ray, identical in every respect with the *x*-ray, is produced by substances of high atomic weight, the radiations having their origin in the substance itself, it being unnecessary to excite them. The first observation showed the ray to be very feeble, but by various combinations of metals of high atomic weight, radiations of sufficient activity to blister the skin have been produced.

In *Science* of August 29, 1902, the observations of Marckwald are referred to. This chemist has succeeded in preparing a speci-

men of polonium, the radioactive element associated with bismuth. He has definitely identified the substance as distinct from the bismuth with which it is associated. The method used was to take a specimen of radioactive oxychloride of bismuth, dissolve it in acid, and then precipitate the metal by a rod of pure metallic bismuth. Under these circumstances the bismuth becomes coated with a black deposit, which seems to be nearly pure polonium. The radioactivity of the solution is slowly concentrated in the black deposit, which is itself extremely active. The amount of polonium obtained from several kilos of pitchblende residue is only a few milligrammes, from which it is estimated that the amount of polonium in pitchblende is not over one gramme per ton.

K. A. Hoffman has continued his work on radioactive substances from the uranium minerals, especially upon radioactive lead. The radium so obtained is very much more active upon a photographic plate than is polonium. A specimen of radioactive lead sulphide which acted powerfully upon a photographic plate was much weaker in discharging the electroscope than a specimen of polonium oxychloride, which had no effect whatever upon a photographic plate, even after twenty-four hours' exposure. Radioactive lead preparations gain an activity by preservation in dry condition in closed tubes. A number of metals are capable of robbing uranium of its activity. In one solution a specimen of pure uranium was mixed with barium and the latter precipitated by sulphuric acid. The uranium thereby lost its activity both toward the electroscope and toward the photographic plate; after spending two days in a closed tube, the uranium regained its activity. The same phenomenon was observed in another experiment when bismuth was substituted for barium. A number of the rare earths, such as thorium, erbium, didymium, cerium, and lanthanum, are capable of receiving a reduced activity from uranium, and the same is true not only of barium, but also of strontium and calcium. Lead receives a weak activity when precipitated from the uranium solution with sulphuric acid, but none at all when the precipitant is caustic potash.

The above experiments show the activity with which the phenomena of radiant energy are being investigated. It is yet too soon to predict that the x-ray will be produced in quantities available for medical work without the aid of the complicated machinery now required, but the very great value of these forms of radiant energy in therapeutics is now so fully attested that it is to be hoped that useful therapeutic results may be reached by these simpler means of producing the rays.

THE RELATION OF ALCOHOLISM TO IMMUNITY.

It is a well recognized clinical fact that alcoholism predisposes to a number of infectious processes of which pneumonia and suppuration are the most common. Notwithstanding the clinical data very little experimental work has been done in this field. In the year 1896, A. C. Abbott, of the Department of Hygiene of the University of Pennsylvania, performed a series of experiments upon rabbits, subjecting the animals to daily doses of alcohol for a prolonged period, and then infected them with various microörganisms. The results showed that the alcohol diminished their natural resistance. No explanation of this peculiarity was forthcoming, the clinical observation being simply confirmed by the laboratory experiment. It was generally supposed that the harmful effect of the alcohol depended upon some general depression of vitality.

Within a few years many interesting experiments have been performed to determine by what peculiar combination of forces blood-corpuscles and other cells were destroyed in the animal body, and the well known contributions of Von Dungern, Ehrlich, Morgenroth, Bordet, Gengou, Metchnikoff, Malvoz, and others have shown that in all cases of hemolysis, bacteriolysis, and cytolysis, the solution of the cells depends upon the combined action of two substances called respectively the intermediate body and the complementary body. The complementary body seems to be invariable and not specific, and it occurs in the blood of every animal, normal or immune; while the intermediate or immune body, which is also variously called by writers upon the subject the "zwischenkörper," the "fixateur," the "substance sensibilisatrice," etc., is variable and can be gradually increased by the repeated injection of those cells upon which it is intended to act. As a rule, the intermediate body is rarely deficient, and the inability of blood serums to destroy certain bacteria or certain cells depends upon the variable quantities of the complementary substance. It has been found experimentally that the addition to the blood of the typhoid fever patient of very considerable quantities of immune serum replete with the typhoid immune body produces no effect upon the clinical condition and does not bring about solution of the typhoid bacilli present in the blood of the patient. This inactivity is due to the absence of a requisite kind of complementary substance. It is probable that in the blood of a typhoid fever patient the immune or intermediate body is already present in excess, and that all that would be necessary to effect a cure of the disease would be the addition of a sufficient quantity of the complementary substance, were it possible to provide this.

The most recent paper upon the effect of alcohol in reducing immunity or increasing susceptibility is by Abbott and Bergey (*University of Pennsylvania Medical Bulletin*, August and September, 1902). To these investigators it occurred that the increased susceptibility of the alcoholic rabbit, and also presumably of the alcoholic man, depends upon loss of the complementary substance which is in some way destroyed by the alcohol. This they have subjected to experimental confirmation by daily intoxicating rabbits with alcohol, and experimentally determining that the complementary substance in their blood, as estimated by its hemolytic action, was considerably diminished.

These experiments and observations seem to open the way to a clear understanding of many conditions at present obscure, pointing out the serious consequences of the abuse of alcohol, as well as indicating in what direction the future treatment of alcoholic susceptibility must be conducted. It also suggests that the continuous administration of considerable quantities of alcohol in the treatment of the infectious diseases is distinctly disadvantageous.

It is to be hoped that the investigators will extend their experiments into the field of infection and not stop with the demonstration that the complement concerned in hemolysis is destroyed by alcohol.

ORGANISM OF SMALLPOX AND VACCINIA.

According to an abstract in the *Medical Record* of September 20, 1902, Ishigami seems to have discovered the specific organism of variola and vaccinia. The investigations have been carried on at the Imperial Japanese Lymph Station of Osaka since 1893. The organism was found in sections of vaccination sores, both human and bovine. The crusts taken from these sores contained large numbers of a distinct species of protozoa. This same organism was found present during the eruptive stage in the blood and organs of vaccinated animals. It is said to consist of a round or oval greenish cell with a nucleus, and in the early stages of its development is capable of ameboid motion. The sporozoön may be artificially cultivated on a medium consisting mainly of epithelial cells of unvaccinated animals. Calves inoculated with such a culture in two or three days develop vesicles accompanied by a rise of temperature corresponding to those produced after vaccination with ordinary bovine lymph. These vesicles contain the same organism, and calves inoculated in this way acquire immunity to subsequent vaccination with cow lymph. Both variola and vaccinia are due

to the same organism; derived from either source, the cultivated products are identical in their effects. The organism closely resembles microsporidium bombycis, but the latter forms spores with polar bodies which have not yet been demonstrated with certainty on the body which has been identified with vaccine virus.

Among the numerous announcements of a specific organism in variola and vaccinia, the one described by Ishigami seems to have the best claim. Cultures have been made so often, and our present means of recognizing bacteria have become so extended, that if the origin of these diseases was dependent upon a bacillus it would have long since been discovered. Not so, however, with a protozoön which may have been overlooked among the epithelial cells which largely compose the crusts of the smallpox and vaccination vesicle. The question ought not to be difficult to settle, as it is claimed that the organism can be cultivated outside of the body, and it seems to be pathogenic for man as well as animals.

A MOSQUITO-KILLING FUNGUS.

An effort to destroy rats by a special bacillus pathogenic for this animal has been worked out in the laboratory, but unfortunately the practical application seems to be disappointing. One of the latest studies in this direction is by Prof. R. H. Pettit, who has attempted to deal with the mosquito nuisance by cultivating a fungus which destroys these pests. It was recently noted in field work upon mosquitoes that in a certain breeding pond the bodies of mosquitoes killed by a fungus were found in abundance. It is a fungus that is closely related to that which destroys flies in the autumn, and attaches their bodies firmly to the place in which they are found. The body of the insect is at first filled with the spores, after which the growth appears on the outside and completely covers the body of the mosquito with a white shroud. An attempt is to be made to introduce this fungus in situations where the mosquito breeds freely, in the hope that it may restrict the production of these pests.

The difficulty in all such experimental work is in reproducing the natural conditions which favor the development of the fungus. It is by no means certain that every breeding ground of mosquitoes is suitable for the growth of this fungus, hence its mere artificial planting will not admit of its development in sufficient degree to destroy the mosquitoes. Every such study, however, is interesting, and there is always the possibility that it may be fruitful in practical results.

ABSTRACTS.

MEDICINE.

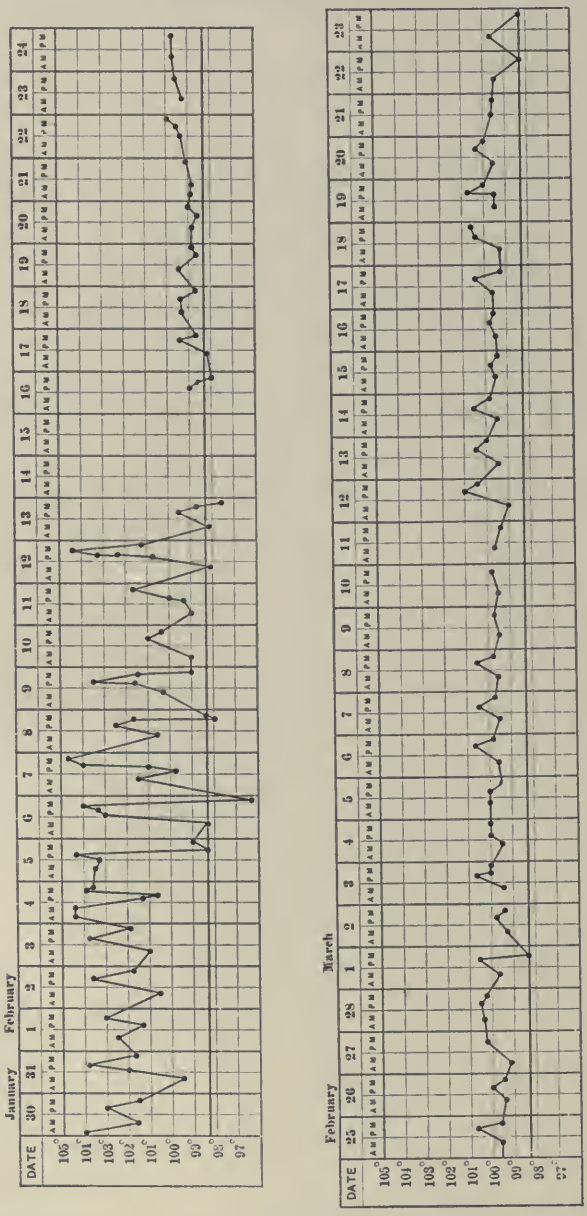
Healing of Ulcerative Endocarditis.—HERRICK, J. B. *Medical News*, vol. lxxxi, No. 10, p. 433, Sept. 6, 1902.

There are two types of acute endocarditis—the vegetative or benignant, and the ulcerative or malignant. Both are infectious in origin, and no sharp line can be drawn between them. On the one hand there are slight clinical signs, at the most a faint cardiac murmur, and on the other, chills, fever, prostration, embolism, and death. The milder type presents only a warty fringe paralleling the edges of the valve, while in the ulcerative form there are crater-like excavations, perforated valves, and a purulent coating. Between these extremes are to be found all degrees of anatomical alteration, and clinically the one form shades into the other. While it is well to preserve the expressions ulcerative and malignant in connection with endocarditis, it should be remembered that the terms are used loosely.

Ulcerative endocarditis has been regarded as a necessarily fatal affection, though the literature shows that cases reported by competent observers have recovered. Some flaws may be picked in the clinical histories, as published, but it is to be remembered that they impressed the individuals who reported them, who were competent clinicians, as being acute endocarditis. Cases of recovery have been reported by Roussel, Dreschfeld, Sansom, Rosenbach, Fraentzel, Davis, Coley, Coleman, Cantley, Washburne, Pye-Smith, Pease, Woldert, Sainsbury, La Vastine, McClure, Powell, Clarke, White, Stockton, and Whitehead and Syers. Abstracts of these histories are given in the article.

Dr. Herrick reports the case of a child of three years with a pneumococcic septicemia starting with throat symptoms—a nearly pure culture being obtained from this locality—causing otitis media and bronchopneumonia. At the end of ten days of serious illness a murmur could be heard at the apex with systole; it varied in quality from day to day. With the appearance of the murmur there were an irregular temperature, a few chills, with the temperature jumping from subnormal to 105°, two crops of petechiæ, a splenic infarction, and a long-drawn-out convalescence with persistent slight

temperature for weeks, but with ultimate recovery of perfect health; yet with the signs persisting, even two years later, of a



Temperature charts of Dr. Herrick's case.

mitral regurgitation, muscular compensation being perfect. A five-year-old brother of this boy had at nearly the same time a similar

sore throat with abundant pneumococci, an otitis media, and a pleurisy. A sister, one year old, had a light bronchitis.

L. Hektoen furnished the writer with specimens, drawings, and descriptions of the hearts of three cases where healing had apparently taken place, and yet the appearances were such as to warrant one in saying that the process was distinctly infectious if not ulcerative.

The first of these cases was a fibrous pericarditis with acute and chronic aortic and mitral endocarditis, with a healed perforation of the aortic valve. There was complete fibrous obliteration of the pericardial cavity. The aortic valves were incompetent to the water test. The valve cusps were thick and sclerotic, with grayish vegetations upon the ventricular aspect. The posterior cusp had fenestration running a little below the upper margin of the corpus arantii to the lateral attachment of the valve; its margins were rounded and for the most part smooth, except near the corpus, where there were typical vegetations. The opening was about one centimeter in length. There were similar vegetations upon the upper surface of the anterior mitral valve, the posterior being sclerotic. The heart weighed 600 grammes. The endocardial vegetations were made up of fibrin with accumulations of mononuclear cells and large masses of cocci. No bacteriologic examination.

CASE I.

The case from which this specimen was taken was that of a laborer who entered the hospital with a history of chills and fever of some months' duration, with cough and shortness of breath for about six weeks. The heart was enlarged, with systolic murmur at apex and rough diastolic murmur over the mediastinum. The liver and spleen were both enlarged. There was capillary pulsation, water-hammer pulse, prominent superficial veins; temperature ranged from 98.6° to 102°.

A second case was that of a healed ulcerative (perforating) endocarditis with hypertrophy, and dilatation of the heart. The patient was 51 years of age, and on admission gave a history of having been sick for two months. His attack began with a cold, followed by swelling of the abdomen and of the ankles. He soon

became short of breath, and eventually had to sit up nights. While there was palpitation of the heart, he had never had pain. There was enlargement of the heart, roughening of the first sound at the apex, and a loud diastolic murmur to the left of the sternum.

Case 2.

At the post-mortem examination the pericardium was smooth, the aortic valves incompetent to the water test, their edges were thick, fibrous, and somewhat retracted, the ventricular surfaces were roughened and faintly granular, the anterior leaflet containing a rounded opening 5 x 7 millimeters.

The third case was that of a man 51 years of age, admitted to the hospital, service of Dr. Herrick, September 17, and who died December 11, 1901. He gave a history of cough with some expectoration during the preceding two months. For two weeks there had been dyspnea, mostly at night, with coincident swelling of the feet. There was a double murmur at the apex. There was diastolic pulsation of the veins in the neck, with enlargement and cardiac dulness. The temperature was normal; the pulse was 70 to 90. Autopsy showed healed ulcerative (perforating) endocarditis of the aortic valves, hypertrophy of the heart, with sclerosis of the pulmonary and coronary arteries. The aortic valves were incompetent to the water test. They were deformed, with wart-like masses of fibrous tissue which, while soft, did not crumble, and which contained fine calcareous granules. In the left posterior cusp was a large circular perforation about one centimeter in diameter; the superior margin was an irregular nodular band 4 x 8 millimeters, while the inferior margin was thin and smooth. The aorta just above this perforation showed a few small, wart-like areas forming outgrowths from the intima. The heart was enlarged, weighing 650 grammes. The myocardium was firm,

Case 3.

somewhat mottled and fibrous, in the apices of the papillary muscles. Bacteriological examination was made of the crushed fibrous masses, the heart, blood, liver, and spleen, but no microörganisms were found.

Enteroptosis.—ARNOLD, W. W. L. *Medical Chronicle*, vol. iii, No. 4, p 225, July, 1902.

This condition may be present in considerable degree without discomfort, but in the majority of cases quite well defined symptoms are present. Among 600 women who were examined in reference to the condition of the abdominal viscera, well marked visceral ptosis was found in fifty-six.

The transverse colon is usually the first portion of the intestinal tract to descend. It is held by strong folds at the hepatic and splenic flexures, hence it becomes V-shaped, the acute flexion leading to dilatation and stagnation of the contents of the large bowel. Associated with this falling of the large intestine there is a crowding downward of the small intestine into the lower part of the abdomen and pelvis. The stomach becomes displaced, the greater curvature often being found as low as the umbilicus or the pubes; the liver descends in some cases, but a marked falling of this organ is rare. The spleen may be displaced, but rarely to a marked degree. The kidneys are usually loose and show various degrees of descent and mobility. Uterine displacements, especially retroflexion and prolapsus, are usually associated with general ptosis of the viscera. Relaxation of the pelvic floor favors descent of the uterus.

Enteroptosis results from several factors acting at the same time. In health only a small part of the weight of the abdominal viscera is borne by the peritoneal folds and cellular attachments of the various organs, the main support being afforded by the elasticity of the abdomen from the intra-abdominal pressure. If the general nutrition is impaired the abdominal walls lose their elasticity, and this favors descent of the viscera and may be alone sufficient to cause it. The favoring conditions are impairment of the general health and feeble muscular development, increased size of the abdominal cavity, and the use of corsets. The latter, if tightly laced, compress the lower ribs and tend to force the viscera downward. This is further aided by the weight of the skirts dragging from the waist line. If a woman is in good health the abdominal wall is not relaxed, and no harm may ensue from wearing corsets. If, however, nutrition is impaired by feeble general health, advanced age, or the distention of repeated pregnancies, corsets undoubtedly

favor descent of the viscera. If such a condition already exists, the corsets aggravate it. After a severe attack of peritonitis the stomach rarely recovers its normal muscular tone.

The symptoms of enteroptosis are varied, and sometimes are indistinguishable from states of malnutrition and neurasthenia. A difficulty in diagnosis is that sometimes the enteroptosis is not attended by symptoms. The sensations of weight and dragging in the abdomen, with aching in the loins and back aggravated by standing or exertion, are frequently present. Chronic dyspepsia, flatulence, and constipation, with attacks of mucous diarrhea, are the more common digestive disturbances. The nervous phenomena are commonly of a neurasthenic type, and the various forms of abdominal neuralgia or visceral neurosis may be present. Special symptoms are caused by the displacement of individual organs; thus the digestive disturbances are aggravated if the displacements of the stomach and colon are marked. Dislocations of the kidney give rise to numerous symptoms, such as renal colic and irritability of the bladder. Disorders of the pelvic organs are frequent, retroflexion of the uterus with descent of the pelvic floor being noted in 35 per cent of these cases.

The main object of treatment is to increase the muscular tone and elasticity of the abdominal walls. This is best accomplished by the persistent use of gymnastic exercises after the Swedish method. If faithfully carried out for some time the muscles are strengthened and there is a marked improvement in all the symptoms and often a cure. It is important that the exercises should be simple and readily carried out by the patient. The following movements are efficient: (1) The patient lies on the back without a pillow, with the arms folded in front. The body is now raised slowly to a sitting position without using the arms. (2) The patient, lying on the back, raises the legs in the extended position, the knees being kept straight to a right angle with the abdomen. Each leg may be first raised singly, then both legs should be drawn up together. (3) Deep breathing and special movements of inspiration with the glottis closed, and after the lungs have been emptied by a forced expiration. These act powerfully by drawing up the viscera and straightening the diaphragm, and they also increase the power of the abdominal muscles. Each of these movements should be carried out six to twelve times each morning while the patient is lying on a bed or firm couch.

In addition to the exercises it may be necessary to give some sort of support to the abdomen; the difficulty with abdominal bands

is their tendency to slip upward and make pressure downward. The so-called straight-front corset is often of value in securing proper support from below, as it does not unduly constrict the waist.

The Present State of Our Knowledge of Diabetes Mellitus.—Tyson, James. *University of Pennsylvania Medical Bulletin*, vol. xv, Nos. 6 and 7, p. 195, August and September, 1902.

According to Tyson, glycosuria may be due to (1) an imperfect assimilation of carbohydrate into fat and proteid in the intestinal villi, as a consequence of which it passes over into the portal circulation in larger quantity than can be converted into glycogen by the liver; (2) a glycosuria due to the overproduction of glucose out of hepatic glycogen; (3) a glycosuria due to the fact that through vasomotor influence the glucose passes through the liver too rapidly to permit its conversion into glycogen; (4) a glycosuria due to defective oxidation of glucose. For such deficient oxidation the pancreas may be responsible either by disease or by interference exerted by deranged suprarenal function.

A source of glycosuria which adds greatly to the complexity of the problem and establishes the most intractable stage of the disease, diabetes mellitus, is the glycosuria arising from the destruction of proteid accompanied by the liberation of glucose. This is seen in the last stages of the disease, when even a pure proteid diet is attended with free excretion of glucose by the urine. At this stage, even the fixed proteids of the tissues yield to the demands of the economy for glucose, and there results rapid emaciation with debility and death, unless the latter is precipitated earlier by the acid toxins, acetone, diacetic and oxybutyric acids which follow in the wake of defective glycolysis.

A Case of Neurofibromatosis.—Adrian, C. *Wiener Klinische Wochenschrift*, 15th year, No. 32, p. 813, Aug. 7, 1902.

The patient, 56 years of age, comes from a long-lived family. Her mother had many small tumors upon her body. The patient since early life has noted tumors of the skin, especially one on the right shoulder. All infection, either acute or chronic, is denied. Some thirty years before she entered the hospital a tumor of the scapula was removed by operation. At that time it had reached the size of a child's head, and weighed one and a half pounds. In the years since the tumor was removed there has been a progressive deformity of the spine and thorax. In her fifth year the patient met with a fracture of the lower extremity, which healed promptly.

During the last three years there has been a firm swelling of the skin and a thickening of the underlying tissues on the inner side of the left elbow; during the same time there have been subjective chilly sensations and some cyanosis of the hands and feet. In October, 1901, there appeared a swelling upon the right side of the neck. This was painless and continued for about two months, slightly increasing in size, after which the growth was more rapid.

At the time she was admitted to the hospital she was decidedly thin and cachectic. The mucous membranes were pale and the muscles were weak; the temperature was normal. The skin was found to be covered with tumors varying in size from that of a pin-head to a hazelnut. The hairy scalp was free from these tumors, but there were a number upon the forehead and a still

larger number upon the chest and back, the arms being studded with them, and fewer upon the lower extremities. On the inner side of the right arm, extending from its middle to a handbreadth below the elbow, was a swelling of the skin which seemed to involve the subcutaneous tissues. The swelling was soft and was found to

spring directly from the brachial plexus, with which it was connected by a pedicle, which could be felt.

In the right supraclavicular groove was a swelling extending upward as far as the occiput and the mastoid process. This swelling was not directly connected with the bone of either clavicle or the

scapula, but projections of the tumor could be felt going behind the clavicle.

There was no enlargement of the glands. The cervical vertebræ were pushed toward the right. There was scoliosis and kyphosis.

April 21, 1902, an incision was made over the tumor of the neck. It was found to be firm, and when dissected out, to be connected by two nerve bundles with the brachial plexus. Upon examination it was found to be myxomatous. The patient died as a result of the operation from acute hemorrhage from the jugular vein.

The diagnosis at the autopsy was multiple fibromata of the skin; multiple neuromas of the cervical and brachial nerves, with a neuromyxoma of the right supraclavicular region; neurofibromata of the duodenum and sarcomatous degeneration of the neurofibroma of the duodenum; miliary fibroma in the stomach, the walls of the intestine, and mesentery; chronic catarrh of the stomach was associated with brown atrophy of the heart and liver. In addition there was arthritis deformans of the right elbow and shoulder.

The most interesting thing in the case is the extensive neurofibromatosis associated with neuromas and sarcomatous degeneration in the intestine.

The Radical Treatment of Chronic Intestinal Tuberculosis.—Robson, A. W. Mayo. *Lancet*, vol. clxiii, No. 13 of vol. ii, p. 851, Sept. 27, 1902.

The writer reports a number of cases in which tubercular processes in the intestine were relieved by radical operation. The suggestion is made that where they cannot be dealt with in this way short-circuiting may put the part at rest, thus relieving it from irritation and enabling the ulcers to heal. In cases of tubercular peritonitis, a mere incision of the abdominal cavity will not always arrest the process. In these cases it is sometimes possible to remove the focus of the disease, and in this way the process is brought to a termination. The explanation of the return of the fluid in tubercular peritonitis is probably to be found in the fact that there is a definite focus of tubercular infection apart from the diffuse process in the perineum. Such focus may be in the Fallopian tube or bowel, and if it is not removed it will form the starting-point for a fresh invasion of the peritoneal cavity. If this explanation is correct, the remedy is quite clear. Wherever the original disease may be, it should be removed, where this can be done without adding seriously to the risk of the operation. He has acted on this principle in a number of operations for tuberculous peritonitis, removing masses of retroperitoneal or mesenteric lymph glands,

tuberculous Fallopian tubes and ovaries, loops of tuberculous intestines and tuberculous appendices, with such success that he feels justified in recommending these more radical methods.

Repeated Small Hemorrhages as a Cause of Severe Anemia.—HERRICK, J. B. *Journal of the American Medical Association*, vol. xxxix, No. 13, p. 767, Sept. 27, 1902.

Five cases of severe anemia are reported, due to frequent slight hemorrhages. One of these patients had a history of repeated losses of blood from hemorrhoids extending over several years. For the ten months before he came under observation the hemorrhage had been severe. The ordinary anemic symptoms were present in the form of dizziness, occasional attacks of syncope, and palpitation. The hemoglobin was 18 per cent and the red corpuscles 1,052,000. Following six weeks' treatment and an operation upon the hemorrhoids, the red corpuscles increased to 3,000,000 and the hemoglobin to 36 per cent.

The practical deduction is that a severe secondary anemia may cause pallor and weakness equal to that of the pernicious type, or it may suggest some hidden malignant disease. Such anemia may be due to repeated small hemorrhages often from a condition as easily recognized and easily remedied as hemorrhoids. This form of anemia may prove fatal, and cases of a transformation of the type into the pernicious variety have been reported. A careful blood examination, showing as it does the chlorotic or secondary type of anemia, should encourage immediate measures looking toward the checking of the hemorrhage; this stopped, recovery, though it may be slow, is generally complete.

Changes in the Spinal Cord and Medulla, in Pernicious Anemia (The Shattuck Lecture).—BILLINGS, FRANK. *Boston Medical and Surgical Journal*, vol. cxlvii, Nos. 9 and 10, pp. 233 and 257, Aug. 28 and Sept. 4, 1902.

The writer in concluding the lecture draws the following deductions: (1) That there is a well established relation of diffuse cord degeneration with pernicious anemia. (2) It seems highly probable that the hemolysis and the cord changes are due to the same toxin. (3) While the source of the toxin is unknown, the fact that gastrointestinal disturbance is so common in the disease would lead one to suppose that it is of intestinal origin. (4) The diffuse degenerations of the spinal cord which occur in conditions without pernicious anemia do not appear to differ essentially from those of

pernicious anemia. (5) It is possible that a common blood-circulating poison exists, which may expend its force upon the blood in one individual, upon the nervous apparatus in another, and coincidentally upon the blood and spinal cord in others.

SURGERY.

Operation for Chronic Non-malignant Disease of the Stomach.—BARKER, ARTHUR E. *Lancet*, Aug. 23, 1902, p. 501.

Thirty Cases of Gastroenterostomy for Non-malignant Affections of the Stomach.—DALZIEL, T. K. *Lancet*, Aug. 23, 1902, p. 403.

Barker reports ten cases of non-malignant disease of the stomach and duodenum, in which an operation was performed, all recovering. The detailed history of these cases shows that they all suffered from profound disturbance of the general health, and probably the most of them would have resulted fatally if operation had not been performed. One of the cases was for duodenal ulcer, with severe hemorrhage from the bowels. Another was for gastric ulcer, with hour-glass contraction of the stomach and extreme emaciation. A third was for bleeding gastric ulcer without stenosis of the pylorus. The remaining seven cases were for pyloric stenosis due to gastric ulcer, with the possible exception of one, in which a tumor was found in the pylorus which was of doubtful nature. In eight of the cases treatment was required on account of the obstruction to the escape of food from the stomach.

The early history of these cases presented striking dyspeptic symptoms of varying nature. Washing out of the stomach is a valuable means of treatment where stenosis is marked, but is largely palliative, though it may be of great importance in preparing the patient for operation. Dilatation was a marked symptom, especially in those cases which had received no preliminary treatment. With careful dieting this complication can be largely prevented, even where the outlet of the stomach is greatly narrowed. Dilatation may occur due to spasmodic contractions of the pylorus, when the surface of the stomach is irritated by improper or irritating food without an ulcerative process at the ring. In such cases the early removal of an undigested residuum from the stomach some hours after meals eliminates the source of irritation and gives the pylorus rest.

In estimating the degree of dilatation, percussion alone is an unsatisfactory method. If the stomach contains much gas, its size

is easily demonstrated by percussion, but in many cases there is little gas but a large quantity of fluid and undigested food. It is a good rule to first estimate the degree of dilatation by percussion, then withdraw the contents of the stomach, which are measured, after which the organ is filled with water until discomfort is produced, and then the fluid is withdrawn and the quantity noted. Finally the empty organ is to be inflated and its outlines again noted by percussion. The method of injecting fluid or air has a further purpose, as by it the muscular power of the stomach may be estimated. If the fluid is returned with force, it indicates that obstruction is probably marked, and that after a gastroenterostomy a rapid return to the normal may be expected. If the fluid in a largely dilated stomach is returned with little force, or has to be siphoned off, there may be stagnation in the stomach from atony even after such an operation, and it may be better to postpone the latter until by a course of washings and tonics the organ is more or less restored to its normal contractility.

A routine preparation of the patient consists in cleansing the stomach for several days by washing and the administration of small quantities of sterile fluid food. The mouth is at the same time cleansed, and carious teeth extracted. Ten grains of carbonate of bismuth is given three times daily, and the lower bowels are relieved by enemata. In cases of great emaciation, hypodermic instillations of normal saline solution are made.

In making the gastroenterostomy, the serous and muscular coats are united behind the proposed opening, before the latter is made. Then by opening the gut and uniting the resulting edges, the continuous suture which had been begun is carried over the front.

In the after-treatment of non-malignant pyloric stenosis, the patient, as soon as he is removed from the table to the bed, is placed on his back a little inclined to the right. Usually on the second day they are allowed to resume the semirecumbent position, and are placed on the right side for sleep or change of position. In such position the contents of the stomach more readily drain through the new opening. Nourishment is given as soon as the nausea following the anesthesia passes off. At first albumen water with some brandy is given every two hours, which is increased in frequency and quantity until the fourth or fifth day, when some solid food is administered.

Dalziel reports thirty operations in cases commonly labeled dyspepsia, in many there being marked pyloric obstruction. The patients had been under treatment prior to operation for periods

varying from two to eight years. In eighteen there was well marked contraction of the pyloric orifice found at the time of operation. The ultimate results in these thirty cases were favorable; in only one did death result. In some of the cases the time which has elapsed is too short to give a satisfactory prognosis, but in eighteen the patients state that they are as well as they ever were, all of the distressing symptoms having been relieved. As a rule the operation is followed by a marked improvement in weight.

Prostatectomy.—THORNDIKE, P. B. *Boston Medical and Surgical Journal*, vol. cxlvii, No. 9, p. 233, Aug. 28, 1902.

The writer admits that there are brilliant possibilities in the management of prostatic hypertrophy by any of the approved methods of operating, and occasionally there is a case that does well by the use of a catheter. Where the palliative procedures do not give relief, he believes that we are justified in undertaking a radical exploration of the bladder by the suprapubic method. In all he has operated upon nine cases, with but one death. Of the eight cases which survived operation, six were cured. By the latter is meant a complete removal of all obstructing tissue with practically no residual urine. The present condition of these six patients is known. Of the two remaining cases, one was completely relieved excepting that he had not regained full control of the urine. In the second case in which the result was unfavorable the operation was done too late, after both kidneys and bladder were extensively diseased, and after the bladder had contracted to a small, thick pouch. In this case the removal of the obstructing prostate came so late that recovery of the diseased organs was impossible.

The writer advances a plea for prostatectomy in general, and not for any special form of operation, or for any operative technique. Fuller's method of operating is given: The patient is on the back, neither the Trendelenburg position nor the Peterson bag being commonly found necessary. The bladder is carefully washed out, and then left moderately distended to the extent of eight or twelve ounces. The next step is to open the bladder suprapubically, the general directions which have been laid down by Keyes being followed. The forefinger of the left hand is then introduced into the bladder, the location and extent of the prostatic obstruction is determined, and the vesical opening of the urethra located. In the right hand is grasped a pair of rough serrated-edged scissors with a long handle. These scissors are slipped along the left forefinger to the urethral opening and are made to cut through the

bladder wall in that region. The cut extends from the lower margin of the internal vesical opening of the urethra backward for an inch to an inch and a half. The blades of the scissors, being serrated, make an incision which bleeds but little. Then one of the forefingers is slipped through the vesical hole made by the serrated scissors; at the same time the fist of the other hand makes firm pressure against the perineum. By means of this counter-pressure the prostatic growth is brought well into the reach of the forefinger of the other hand, which is employed all this time in enucleating the prostatic obstruction either *en masse* or piece by piece, as the case may be. The enucleation can be easily accomplished in this manner, and all lateral and median hypertrophies, as well as all hypertrophies along the line of the prostatic urethra, should be removed.

An Operation for Hydrocephalus.—HUNTER, H. M. *Pediatrics*, vol. xiv, No. 4, p. 130, Aug. 15, 1902.

The theory underlying the writer's operation for hydrocephalus is Hill's observation that there is a balance in pressure between the veins of the membranes and the cerebrospinal fluid. In practically all cases of hydrocephalus, Magendie's foramen and all channels through which the cerebral fluid reaches the subarachnoid and subdural spaces are closed.

The operation performed by the writer was upon an infant who was seen July, 1899. There was no sign of disturbance of the brain prior to one month before, at which time it was noted that the head was increasing in size. Within one month the head was enormously distended, measuring twenty-one inches, the bones being widely separated; the pressure was so great that the eyes protruded, and the baby was blind. There was high fever and restlessness.

An incision was made in the anterior fontanel, and a single flap turned down so as to expose the dura mater on both sides. Then three or four strands of No. 0 catgut were passed through the cortex into the lateral fontanels. As soon as the ventricular cavity was opened, the fluid poured out. The membranes were sutured and the flap placed in position; a copious gauze dressing was applied to the head. The fluid continued to escape for three or four days. In a few hours the bones met and the child regained its sight. The improvement effected by the operation continued for six or eight weeks, at which time it was noticed that there was a gradual enlargement of the head, which progressively increased until November 20, and the condition of the child again became critical. In the

second operation a straight incision one inch long was made over the lower angle of the external fontanel down to the dura. The latter was opened for a distance of about one-third of an inch, and ligatures of No. 2 catgut were inserted into the lateral ventricle, as was done in the first operation. The dura was sutured and the scalp incision closed. This time there was no escape of fluid through the closed incision, and the fluid did not reaccumulate.

A Modification of the Barker Method for the Treatment of Fractures of the Patella.—WILLIAMS, H. T. *Philadelphia Medical Journal*, vol. x, No. 14, p. 475, Oct. 4, 1902.

The subcutaneous method of suturing fractured patella is preferable to a method in which the joint is freely opened. The operation devised by the writer differs from Barker's in that a double ligature

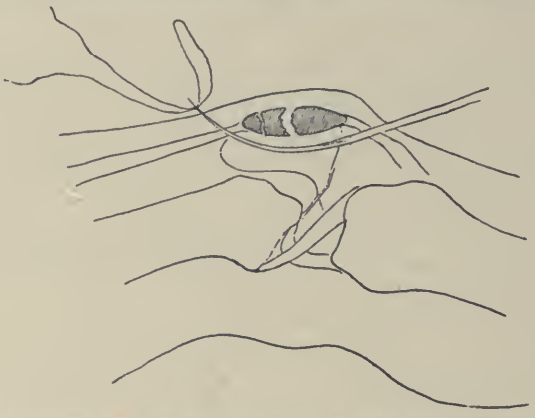


FIG. 1.—Showing needle passed below fragments of patella and eye of needle threaded with double ligature.

FIG. 2.—Showing needle with loop ready to pass above fragments of patella.

of wire or silk is used. In the Barker method the needle is first introduced through the ligamentum patellæ and passed upward beneath the fragments and through the insertion of the quadratus, and then through the incision in the skin above the patella. The needle is then threaded with a single strand and withdrawn, leaving the suture beneath the patella. The needle is passed through the same opening below the patella and out at the upper opening, where

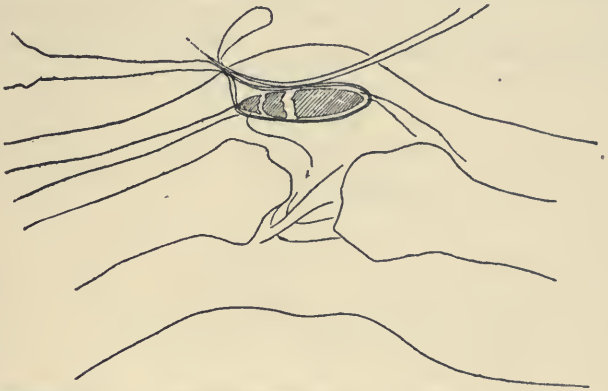


FIG. 3.—Showing needle with ligature passed above fragments of patella and out through first point of exit.

FIG. 4.—Showing ligature passed around fragments and one end of ligature passed through loop.

it is rethreaded with the upper end of the ligature and withdrawn so that the ends of the ligature will both present at the lower opening, where they are drawn tight and tied or twisted.

In the writer's method the needle is armed with a double ligature, which is passed beneath the patella and out upon the opposite side. The two ends of the ligature are held outside of the skin and the needle withdrawn sufficiently to bring it with the loop just

beyond the opposite side of the fragments of the patella; then, without withdrawing it from the wound, it is passed above the fragments and brought out through the incision at its first point of exit. The loop is then unthreaded from the eye of the needle and the needle withdrawn; in this manner the ligature is doubled around the fragments, and by not completely withdrawing the needle before it is passed above the patella, it prevents the skin or subcutaneous tissue from being caught in the ligature, as is apt to be the case in the Barker method. After the needle is withdrawn, one end of the ligature is passed through the loop, and after pulling both ends tightly, they are tied firmly, thus making what is known as a Staf-

FIG. 5.—Showing operation completed. Staffordshire knot.

fordshire knot. Manipulation of the fractured bone aids in arranging the fragments in proper position. The ends of the ligature are cut off, and the small incisions below the patella are closed with one or two sutures. This method of uniting the fractured patella has been employed in two cases successfully.

A New Method of Circumcision.—KLOTZ, W. C. *New York Medical Journal*, vol. lxxvi, No. 14, p. 575, Oct. 4, 1902.

The writer calls attention to some of the disadvantages attending the ordinary operation for circumcision. In removal of the redundant tissues, there is taken away not only the mucous membrane and the skin, but also the superficial fascia, including its blood-vessels and lymphatics. This so disturbs the circulation of the parts that there is considerable edema, which may persist for a considerable

time after operation. Sometimes granulation tissue is produced, which undergoes cicatricial contraction and forms a constricting ring behind the coronal sulcus.

The principle in his modified operation, which was suggested by von Zeissl, who used it in the treatment of irreducible chronic paraphimosis, is to remove a cuff-shaped flap of skin, leaving intact the areolar tissue with its blood-vessels and lymphatics. The parts are prepared in the usual way and anesthetized by infiltrating with cocaine. The first incision is a longitudinal one (*C*, Fig. 1). The

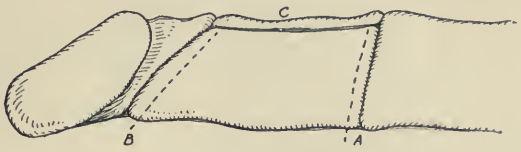


FIG. 1.

FIG. 2.

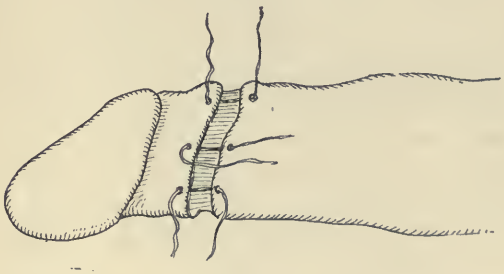


FIG. 3.

length of this longitudinal incision corresponds to the amount of integument it is desired to remove. Two circular incisions are then made, the anterior one being somewhat oblique (Fig. 1, *B*, *A*), just going through the skin. The skin is then dissected from the underlying tissues, and a cuff-shaped section removed. The progress of the dissection is outlined in Fig. 2. As a rule, there is very little hemorrhage. If the tissues are swollen from the infiltrated cocaine solution, strips of gauze wrung out of hot salt solution may be

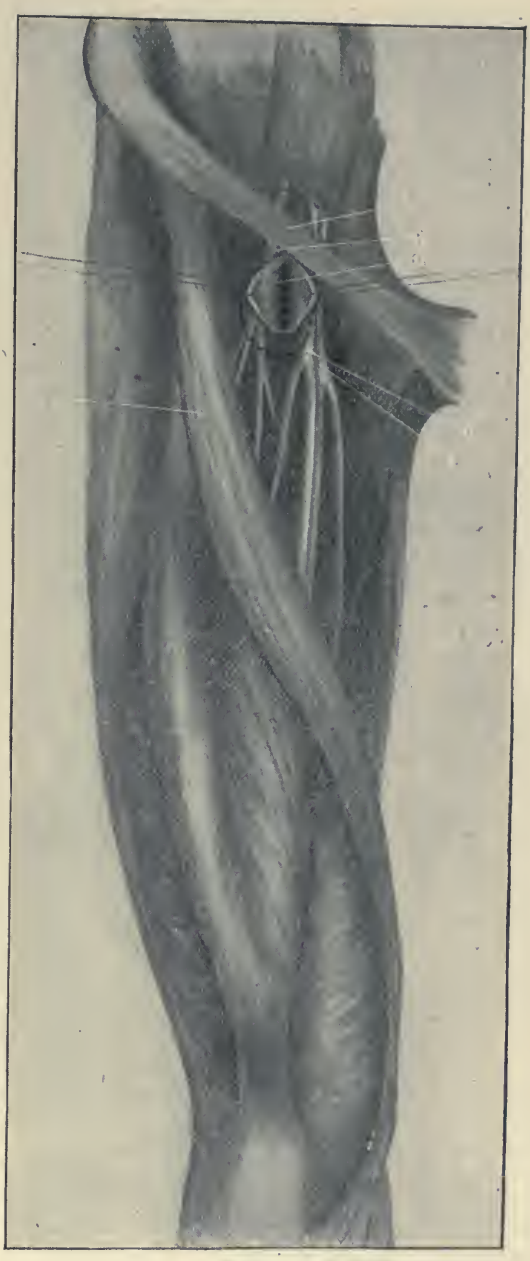
applied and held with gentle pressure for a few minutes. The two edges are then brought together, and united by interrupted horse-hair sutures, as shown in Fig. 3. Primary union takes place promptly, and the sutures may be removed about the fifth day. There is, as a rule, no swelling or edema, and at the end of a week the skin is freely movable over the subjacent parts.

In case paraphimosis is present, the longitudinal incision is made first, and sufficiently long to go beyond the inflammatory exudate and to divide all constricting bands. The circular and oval incisions are made at either end, and the skin is dissected off, as described. The operation is not practicable in very young individuals. In adults it requires more time than other methods, but the results obtained repay the additional trouble. With this method it is possible to accurately determine the amount of tissue to remove. Its principal advantages are absence of hemorrhage and freedom from edema and induration.

The Iliopsoas Bursa and its Surgical Importance.—LUND, F. B. *Boston Medical and Surgical Journal*, vol. cxlvii, No. 13, p. 345, Sept. 25, 1902.

This bursa, which extends from the capsule of the hip-joint upward to the brim of the pelvis, receives scant attention from anatomists and surgeons. In three instances in the writer's experience inflammation of this bursa has simulated deep abscess in front of the hip-joint. In one of the cases operated on by the writer a diagnosis of strangulated hernia had been made.

The anatomist generally dismisses the subject with the statement that between the insertion of the ileus muscle and the capsule of the hip-joint there is a bursa which sometimes communicates with the joint by an opening of variable size. Collections of fluid in this bursa give rise to a deep-seated tumor which lifts the femoral vessels. It may be mistaken for a clot, abscess, cyst, or an old hernial sac. The inflammation of the bursa may extend to the joint, and *vice versa*. In two of the writer's cases the primary disease was in the joint, but the extension of the disease to the bursa resulted in the latter affection dominating the symptoms. In an examination of eighteen subjects in the dissecting-room, the bursa was found to be connected with the hip-joint by a free opening in three. In the others there was no communication with the joint. In about half the cases the bursa extended up over the pelvic brim. In cases where there is an opening between the joint and the bursa and the latter is diseased, the bursa affords a ready method of treating the joint and of exploring it. The bursa is reached by a vertical



THE ILIOPSOAS BURSA.—Drawing by Miss Byrnes, from a dissection by the writer. *A*, Poupart's ligament; *B*, anterior crural nerve; *C*, bursa opening through the fibers of the iliopsoas and retracted by threads; *D*, femoral artery; *E*, femoral vein; *F*, sartorius muscle. The dotted line represents the limits of the bursa in this case.

incision just below Poupart's ligament between the anterior crural nerve and the femoral artery; the iliopsoas muscle is drawn inward, or its fibers separated by a blunt dissection in the line of incision.

A New Use for the Useless Appendix in the Surgical Treatment of Obstinate Colitis.—WEIR, R. F. *Medical Record*, vol. lxii, No. 6, p. 201, Aug. 9, 1902.

Weir reports the case of a young man 31 years of age who had for nearly three years a persistent diarrhea, the dejections of late being bloody. Anemia was marked. The red corpuscles were reduced to 2,024,000, and the hemoglobin to 27.5 per cent. He had from twenty to twenty-five passages from the bowels daily. Upon rectal examination a fibrous polyp was found just above the prostate. This was removed, but the bleeding continued. The proctoscopic examination showed no thickening of the intestines, nor ulceration. In April an exploratory incision above the umbilicus was made, which showed a thickened and congested colon. It was determined to make a fecal fistula. After the incision was carried down to the cæcum, the appendix rose into view, and it was determined to employ it in making the fistula. It was fastened to the skin and the wound closed. Two days after the appendix was attached to the abdominal wall irrigations were begun, after which the patient rapidly improved.

The writer contrasts this operation with the Gibson-Kader method, in which the cæcal fistula is made in the same way that gastrostomy is performed; that is to say, by placing a rubber catheter of medium size in a small opening in the bowel and then applying two or three purse-string sutures so as to invert the peritoneal coat. In using the appendix the operation is simplified, there is less liability of infecting the surrounding tissues, and owing to the normal muscularity of the appendiceal wall marked leakage is prevented. There is not the same tendency of the fistula to close.

A Case of Brain Tumor Recognized Clinically and Located by the Roentgen Rays.—MILLS, CHARLES K., and DEAVER, J. B. *Philadelphia Medical Journal*, vol. x, No. 13, p. 439, Sept. 27, 1902.

This is the second tumor located during the life of the patient by investigation with the *x*-rays. The shadow of the tumor coincided with its position as determined by a study of the clinical symptoms. The operation was performed in two stages, as at the first operation there was profuse hemorrhage. In the second opera-

tion the hemorrhage was controlled by compression of both carotids. The patient died a few hours after the operation. This experience confirms the view that operation should be recommended in most cases of brain tumor where the neoplasm can be located in a region accessible to the surgeon's knife. The tumor in this case was of large size, and if it had been operated earlier the result would probably have been different. There was erosion of the skull, which was accompanied by increased vascularity, the dangerous hemorrhage seeming to come chiefly from the diseased bone.

THERAPEUTICS.

Some Experiments with Paraffin.—Comstock, A. E. *Medical Record*, vol. lxii, No. 18, p. 686, Nov. 1, 1902.

The proposed use of paraffin in surgery, and its probable more extensive employment in the near future, have led the writer to perform certain experiments to ascertain the easiest methods of using it, and above all the proper melting point. He used mixtures of soft commercial paraffin having a melting point of 120° F., and white cosmolin melting at 100° F. Mixtures of these two were prepared which melted at 102°, 104°, and 110° F. respectively. The paraffin was sterilized by boiling for thirty minutes over a flame, the beaker being protected by an asbestos screen. The upper portion of the liquid was then decanted, leaving all sediment behind. The syringe which is best adapted for the injections is a metallic aspirator which is large enough to hold the heat. The instrument must work perfectly and have tight joints. After the instrument has been filled with the liquid it is left in hot sterile water until ready for use. After the parts have been thoroughly sterilized the instrument is taken from the water, the air is forced out, and after waiting a second until the paraffin becomes a thready mass, the needle is inserted into the cellular tissue and the paraffin gradually injected, withdrawing the needle at the same time.

Care should be taken to have the pressure upon the piston regular; otherwise the paraffin will penetrate the tissues unevenly and in situations where it is not needed. After the injection is completed the mass has a doughy feel and can be molded to a certain extent, unless there is too great tension of the skin, in which case it will flatten out. This is especially true in loose, subcutaneous tissues, and when the paraffin has a low melting point.

A number of rabbits were injected with paraffin of various melt-

ing points, the paraffin being removed at varying intervals. In each instance it was found that the foreign body had undergone a sort of organization; the cells of the tissue had penetrated the mass. In one instance a rabbit had the blood-vessels injected, and the paraffin was found to have been penetrated by the injection fluid, showing that it had traversed small blood-vessels contained in the newly formed tissues in the paraffin mass. This, the most satisfactory of all the experiments, was made with paraffin having a melting point of 110° F. In one instance the rabbit was injected with paraffin having a melting point of 104° F., which is the normal temperature of the rabbit. The injection remained fluid and presented a soft, fluctuating mass for one week, gradually becoming firm and afterward organizing.

In injecting paraffin in the human, allowance must be made for the difference in temperature between man and the rabbit, which is about four degrees. In surgical work the paraffin should have a melting point of 106° or 107°. This retains its form, and its melting point is beyond that of any rise of temperature that may take place in the body. It is not necessary to use a local anesthetic, as the pain of the injection is so trifling that a one-per-cent solution of cocaine at the point of puncture is all that is necessary. It is probable that a firmer and better result will be obtained with paraffin at a melting point of 110° F. There is a natural shrinkage after the injection; hence it is desirable to use a larger quantity than is ultimately desired.

The paraffin becomes organized in about four months where the mass is about 2 centimeters in length, 1½ in width, and 1 in thickness. In some cases the central portion becomes encapsulated after about three-quarters of the entire mass has become organized.

What Means Other than Operative Have We for Preventing or Combating Inflammation of the Mastoid Cells?—THEOBALD, S. *New York Medical Journal*, vol. lxxvi, No. 11, p. 447, Sept. 13, 1902.

Attention is called to the importance of constitutional treatment in diseases of the ear. The prevention of inflammation of the mastoid cells relates to chronic inflammatory processes of the ear and of acute otitis media. In the first mentioned class the indications are to control the inflammation in the tympanum, and so do away with the risk of its extension to the antrum and mastoid cells. Attention should be given to the general health, constipation if present should be eliminated, and an effort made to find the antiseptic solution which exerts the most effectual control over the suppuration. This

local treatment the patient should be taught to use himself. The ear should be syringed or douched as often as necessary to keep it clean and dry. The antiseptics which the writer has found most useful are the bichloride of mercury and boric acid, the latter being used in a saturated solution, and the former in solutions ranging from 1 to 8000 to 1 to 4000. Except when the discharge is very profuse a daily syringing suffices, and after a short period of treatment it is usually possible to increase the period to a week or more.

To avoid implication of the mastoid cells and acute inflammation of the middle ear, energetic treatment should be employed. Success in limiting an acute inflammation to the tympanic cavity depends largely upon the virulence of the infection. There is no objection to relieving the pain in these cases, which is readily accomplished by a solution of atropine and cocaine:

Atropine	2 grains.
Cocaine	4 grains.
Oil of sweet almonds	4 drachms.

Six to ten drops warmed and poured into the ear three or four times in twenty-four hours.

Energetic purgation is useful in lessening local inflammation. Pyrophosphate of sodium should be given in twenty-grain doses every two hours for an adult, and ten to fifteen grains for a child. It exerts a controlling influence upon the suppurative process.

A New Silver Salt in the Treatment of Gonorrhea —CHRISTIAN, H. M. *Medical Record*, vol. lxii, No. 13, p. 494, Sept. 27, 1902.

The discovery of the gonococcus by Neisser has led to a search for a remedy that would destroy the parasite and at the same time not injure the affected mucous membrane. Nitrate of silver is undoubtedly efficient, but it causes marked changes in the tissues. The same is true of most antiseptics; if of sufficient strength to kill the gonococcus, they cause ulceration and consequent stricture of the urethra. Many new silver salts have been prepared, but most of them have such a slight penetrating power, or their antiseptic properties are so trifling, that they are quite valueless. Recently A. C. Barnes (*Medical Record*, May 24, 1902) described a salt of silver in which the metal was combined with a proteid derived from wheat. The percentage of silver in this compound is said to be at least three times greater than in most of the combinations of silver with organic substances now upon the market. This substance has a remarkable solubility, dissolving in less than its own weight of water, so that it may be used in any strength. It does not coagu-

late albumin, nor precipitate chlorides. He gave it the name "vitellin."

During the past year Christian has employed the remedy in 100 cases, mostly dispensary patients. In 48 cases the records were complete, and of these 45 were cured. There was a direct effect of the remedy upon the discharge, which in 31 promptly ceased, in 14 there was a more gradual reduction, and in 3 cases there was very little effect. Attention is especially called to the fact that the remedy is unirritating, and may be used in solutions as strong as five-per-cent with no discomfort.

Methylene Blue in Sciatica.—VALLECK, A. S. *Australasian Medical Gazette*, vol. xxi, No. 8, p. 413, Aug. 20, 1902.

The writer's attention was directed to the value of this remedy by the success of Zwar (*Australasian Medical Gazette*, June, 1902) in the treatment of supraorbital neuralgia. The patient was a tramp who had suffered from sciatica for two years. Of late the malady had become much worse, and there was great pain on walking. The thigh on the affected side had lost one inch in circumference. The nerve could be easily felt, and was thickened and tender. A week's rest in bed with the administration of iodides and alkalies gave no improvement. An effort was then made to inject fifteen drops of a saturated alcoholic solution of methylene blue into the nerve at a point between the ischial tuberosity and the great trochanter, but the attempt was a failure. Two days afterward a second effort was made, the syringe being entered below the border of the gluteus maximus. The nerve was felt with the fingers of the left hand, and the needle was thought to have penetrated the sheath of the nerve. Fifteen minims was injected, and the pain ceased abruptly. A week later the patient left the hospital and declared that he was quite free from pain.

The writer is of the opinion that possibly the beneficial effects may have been due to the alcohol, and should he have a similar case he will try the injection of alcohol alone.

Treatment of Ileus with Large Doses of Atropine.—ARONHEIM. *Wiener Klinische Rundschau*, 16th year, p. 720, Sept. 14, 1902.

Batsch about eighteen months ago reported a case of paralysis of the bowels following operation, in which, notwithstanding the use of opium, hot compresses, and washing out of the stomach, no improvement was noted in the symptoms. Later, atropine sulphate 0.005, injected subdermically, was followed by a reëstablishment of

peristalsis. About eighteen cases have been reported in which this symptom has been overcome by atropine. In most of these cases the dose was large, the usual amount of a milligramme being increased four or five times.

The case reported by the writer was that of a man who was suddenly taken with a pain about a handbreadth to the left of the umbilicus. This region was very tender, the pain and nausea not being relieved by morphine. For the next two days no movements of the bowels were obtained, and a diagnosis of ileus was made. On the third day an injection of 0.003 of atropine sulphate was made. This was followed by immediate improvement in the pain, and later by a copious stool.

Preparations of Cacodyl in the Treatment of Tuberculosis.—KOCK, AAGE. *Nordskt Medicinskt Arkiv*, Bd. 35, 3, e foljden, Bd. 2; *Innere Medicin*, 1902, Afd. II, Haft 2, p. 97.

The writer closes an extended study of 29 cases of tuberculosis treated with cacodylate of sodium. Tables are given showing the blood examination, local process in the lungs, and the general progress of the patient under treatment. It is stated that the cacodylate of sodium has the same therapeutic effect as arsenic in other combinations. It causes the same unpleasant symptoms in some patients, such as headache, congestion of the eyes, loss of appetite, diarrhea, excessive sweating, and albuminuria. Locally in tuberculosis it causes a decrease in the expectoration and lessens the cough. There is not the same tendency to night sweats. The cacodylate improves the local conditions in the lungs, the râles are decreased, and in a few cases there is increased resonance. In some of the cases which were far advanced the drug exercised an unfavorable influence upon the tubercular process. As a result of these observations, the writer comes to the conclusion that in the early cases of tuberculosis of the lungs this drug is indicated. It is not in any sense a specific, but is an important adjuvant to other treatment.

The Comparative Value of the Different Methods of Administering Thyroid.—BRIQUET. *La Presse Médicale*, Tome II, No. 74, p. 882, Sept. 13, 1902.

In the review of the varieties of thyroid medication, the writer comes to the conclusion that subcutaneous injection of thyroid extract is only necessary when it is impossible for the stomach to absorb. The ingestion of the fresh gland is the most certain mode of thyroid medication, but its general application is impracticable. The most available preparations are those made from the desiccated

gland, which include those that have been reënforced by the so-called active principle. To the first the writer gives the preference in the majority of cases. Iodothyrin is an active principle of value in certain cases of myxedema, but in general it lacks the power of an extract of the whole gland. It may be administered in cases in which the extract is not well tolerated by the stomach, and in which the administration of the drug is followed by the symptoms of thyroidism.

The Internal Use of Carbolic Acid.—DESSAU, S. H. *Pediatrics*, vol. xiv, No. 6, p. 212, Sept. 15, 1902.

Carbolic acid is chiefly useful in the treatment of catarrhal complaints involving the respiratory tract. Especially is it of value in those disorders due to the influenza bacillus. The symptom-grouping in these cases often consists of a dry cough, sometimes paroxysmal, the expectoration not being viscid. The physical examination shows few or no râles. Coryza is often present. Such cases yield more quickly to carbolic acid than to any other remedy.

The dose administered varies with the age of the child, solutions being employed of one, two, three, and five per cent, an infant under one year of age receiving a teaspoonful of the one-per-cent solution every two hours, while a child of five years is given the same quantity of a five-per-cent solution. A small quantity of glycerin dissolves the acid, and its taste is readily concealed by cinnamon water.

Chloretone in Postoperative Vomiting.—BICKLE, L. W. *Therapeutic Gazette*, vol. xviii, No. 10, p. 653, Oct. 15, 1902.

During the past year the writer has adopted the practice of giving fifteen grains of chloretone two hours before operating. The results as shown in a table of forty-one cases were eminently satisfactory. In only two cases was there vomiting and nausea. A third case, which had great distress after the administration of an anesthetic, was not given chloretone, though it is mentioned in the table.

OBSTETRICS, GYNECOLOGY, AND PEDIATRICS.

Myomectomy versus Hysterectomy.—MCCOSH, ANDREW. *Medical News*, vol. lxxxi, No. 13, p. 577, Sept. 27, 1902.

In fibromata of the uterus less progress has been made in the direction of preservation of organs than in other lesions of the pelvis. There is no question as to the advisability of conservative

surgery in those cases in which the fibroids are small and the organ is not extensively involved; but where there is severe hemorrhage and pain, and fibroids are large, hysterectomy is commonly advised. The writer's judgment is toward conservatism in these operations. If an operation for the removal of a uterine fibroid involved the extirpation of the organ, extreme conservatism should govern the operator. In cases, however, in which the organ can be left, operation may be entered upon with more assurance.

For the removal of uterine fibroids the vaginal route offers in a certain number of cases a suitable approach. If the tumors are subserous, small, and not very numerous, the uterine body can without much difficulty be turned into the vagina through an incision anterior or posterior to the cervix and the tumors extirpated. A disadvantage of the vaginal route is that there is less opportunity offered for thorough inspection of the pelvic organs and less facility in performing the operation. The usual method of reaching these tumors is through the abdomen. The uterus is brought into the wound and a careful examination made to determine whether it is possible to remove all the tumors, and yet leave sufficient uterine tissue to form a useful organ. The mere fact that the tumor is interstitial, or submucous, should not have weight in favor of hysterectomy. The size and number of the tumors may also be more or less disregarded. The cases in which myomectomy is impracticable are those in which the uterus is infiltrated with scores of small fibroids extending into the broad ligament. There are cases in which the tumors are of very large size, in which hysterectomy must be the operation of choice. In the writer's experience, tumors weighing six, eight, and ten pounds have been removed, and frequently their number has exceeded twenty, without sacrificing the body of the uterus.

In conclusion the writer says that in young women with uterine fibroids demanding removal, myomectomy should always be the operation of choice. This operation is possible in the great majority of cases of fibroids. The operation is one that requires the strictest asepsis, and there is about the same danger to life that there is in hysterectomy. The ultimate results in relation to pain and pregnancy are satisfactory.

The Rectal Approach in Obstetrics.—BRIGGS, W. G. *American Medicine*, vol. iv, No. 14, p. 545, Oct. 4, 1902.

The writer describes four cases in which dilatation of the cervix was accomplished by digital manipulations through the rectum.

In this and a former communication attention is called to the value of this procedure, as it avoids any possibility of infecting the genital tract, and by it a more exact and earlier diagnosis can be made.

In delayed rotation the right index-finger in the rectum can often crowd the sinciput backward, or draw the occiput forward, while the left hand crowds the shoulder, or possibly the face, toward the median line. This is a procedure which markedly facilitates rotation. The case of a primipara is described in which the cervix dilated normally, but the second stage was slow on account of delayed rotation. Pressure by the right index-finger through the rectum against the right temporal region, with traction toward the median line on the shoulder, continued intermittently during and between several pains, rotated the head, and labor was terminated normally. This manipulation must be continued for some time, and perhaps be repeated, before the head will retain its new position. In rotating, the head drags with it the uterine tissues, and their elasticity tends to return the head to its former position.

When the labor is delayed by imperfect flexion, or delayed extension, the position may be altered by combined rectal and abdominal manipulations. In delayed or imperfect flexion, place the index-finger as far back on the occiput as possible and crowd the head forward (in relation to the fetus) while the other hand on the buttocks forces the body of the fetus downward, thus approximating the chin to the breast. This pressure should be applied and continued during the pain, and is generally repeated. In delayed extension traction should be made well forward on the sinciput, either with the finger in the rectum or with the palm of the hand applied to the perineum.

In the application of forceps, the index-finger in the rectum is often of great assistance in guiding the blades and in adjusting them to the parietal surface of the fetal head.

Convulsions in Infants.—D'Espine. *Archives de Médecine des Enfance*, Tome V, No. 10, p. 596, October, 1902.

The writer divides infantile convulsions into two main groups, symptomatic and idiopathic. The latter are divided into three varieties: (1) External convulsions, or eclampsia; (2) internal convulsions, or spasms of the glottis; (3) essential contractions of the extremities, or tetany. The first variety is the most common, and is the one usually described by writers.

The relation of epilepsy and eclampsia has been studied. Coutts reports eighty-five cases of convulsions in infants, of whom eleven became epileptic and twenty-nine were affected with other neuroses. Dufour reports fifteen epileptics among sixty-six infants who had had convulsions. D'Espine reports four cases of epilepsy among fifty-four cases of infantile eclampsia. The majority of cases of convulsions in infancy are the expression of a nervous diathesis; they are usually transitory, and clinically very different from epilepsy.

In infantile eclampsia there are no macroscopic alterations of the central nervous system, and microscopic lesions are by no means constant. In the pure types of eclampsia there is no inflammatory involvement of the meninges, though cases are found that are intermediate between these and those in which there are gross or even suppurative lesions of the meninges. The relation of eclampsia to meningeal involvement has been cleared up by the extensive knowledge of these conditions which has been furnished by lumbar puncture and the examination of the cerebrospinal fluid.

In the etiology of convulsions in children heredity plays an important part. Coutts in 100 cases of convulsions in children found that there was marked family predisposition to the disorder in 67. Alcoholism in parents, hereditary syphilis, and lead poisoning furnish a not infrequent number of cases. The age has an important bearing upon eclampsia, it occurring very largely in the first two years, and having a marked predilection for the first six months after dentition. The influence of dentition is less important than rickets, the affection in the latter being explained by the frequency of a gastrointestinal intoxication. Convulsions are rare in the new-born in the absence of obstetrical traumatisms. Drug poisoning, such as that by carbon dioxide, or the injection of alcohol or opium, may cause them, but by far the larger number are due to autointoxication, uremia, indigestion, and enteritis.

The Treatment of Scarlet Fever with Antistreptococcus Serum.—MOSER, PAUL. *Wiener Klinische Wochenschrift*, 15th year, No. 41, p. 1053, Oct. 9, 1902.

The serum prepared by the writer is based upon the theory of Denys that the streptococcus found in scarlet fever is not identical with the ordinary streptococcus, and that it would be possible to prepare a serum in which animals are immunized by injections of a streptococcus obtained from scarlet fever patients. The serum prepared by them was obtained from horses which had been treated by

streptococcus cultures. The germs were obtained from the heart of a scarlet fever patient who had died with a malignant infection. The germ was then passed through small animals, and later cultivated in bouillon.

The treatment of scarlet fever was begun in the St. Anna Child's Hospital, and since then, out of 699 cases of scarlet fever, 81 have been treated with the serum. At first the serum was given in too small quantity and too late. The results have been better since the dose has been increased and it has been given earlier in the disease. The quantity employed has varied between 30 and 180 cubic centimeters.

A marked effect of the serum was a prompt and favorable influence upon the general condition of the patient, the exanthema often not fully developing, or disappearing quickly. The nervous symptoms, temperature, and pulse were markedly improved. The gastrointestinal symptoms commonly disappeared inside of twenty-four hours.

A New Sign of Pleuritic Effusion in Children.—KELLEY, S. W. *Archives of Pediatrics*, 19th year, No. 10, p. 751, October, 1902.

The writer calls attention to the attitude of the patient as being of importance in the diagnosis of pleuritic effusion. Osler says: "When the effusion is large the patient usually prefers to lie upon the affected side." This is not true when the fluid accumulates rapidly. Where the effusion has persisted for a long time there may be a tolerance of pressure on the affected side. The time for the development of the sign which he describes has passed in such cases, and it is no more to be looked for than the friction rub. Shortly after the beginning of the effusion the patient prefers to lie upon the back, or to be propped high in bed, and avoids bending toward the involved side, or pressing upon it. Such an attitude is a sign of an effusion of considerable bulk, which has accumulated with some degree of rapidity. The sign is not always present, but when it does appear it is of value. After the pleura is emptied by aspiration, the patient will often turn and voluntarily lie upon the affected side. If the fluid rapidly reaccumulates, the child will again roll over upon the back. The explanation offered for these phenomena is that pressure upon the affected side hinders the heart's action and adds to the dyspnea. To lie upon the sound side interferes with the respiratory movements of the sound lung. This sign has its chief value in children whose chest walls are flexible.

Status of the Pessary in the Treatment of Displacements of the Uterus. —DAVENPORT, F. H. *Boston Medical and Surgical Journal*, vol. cxlvii, No. 6, Aug. 7, 1902.

Twenty-five years ago the pessary was the sole method of treating uterine displacements. This instrument has been neglected in the rapid development of surgical technique, which offers more certain relief. The pessary is now regaining its position to some extent, and the indications for its use are better understood. In uncomplicated displacements in young women who have not had treatment, operation should be advised. It is also the only method that holds out a prospect of cure in cases which are complicated by lacerations, or in which the uterus is enlarged or very much prolapsed. In the cases where the uterus is small, and where symptoms have been present but a short time, and especially if they are associated with neurasthenia, treatment by the pessary will often cure. In such selected cases relief may be expected in about one-half. Even in cases where a cure cannot be looked for, its temporary use is often of value in relieving symptoms and restoring the general health.

FORENSIC MEDICINE.

An Anti-serum Method of Differentiating Human Blood.—PATEK, A. J., and BENNETT, W. C. *American Medicine*, vol. iv, No. 10, p. 374, Sept 6, 1902.

Uhlenhuth was the first who differentiated the blood of animals by this test. The serum of a rabbit that had been treated with chicken blood gave a reaction (turbidity, followed by flocculent precipitate) when added to a dilute solution of chicken blood, and none with the blood of the horse, donkey, ox, lamb, and pigeon. This success stimulated further experimentation in differentiating the blood of other animals, and more particularly in recognizing human blood. A second series of experiments were carried out as follows:

At intervals of from six to eight days there was injected into the peritoneal cavity of rabbits 10 cubic centimeters of defibrinated ox blood. After five such injections the blood-serum in the rabbits was collected. Solutions of various kinds of blood were then made with water, to which an equal quantity of double normal salt solution was added. All solutions were made of approximately equal dilution. Blood from the following animals was used: Horse, ox, donkey, pig, lamb, dog, cat, deer, fallow deer, hare, guinea-pig, rat, mouse, rabbit, chicken, goose, turkey, pigeon, and human being.

Upon adding six to eight drops of the serum of the rabbit that had been treated with bovine blood, a turbidity occurred only in the tube which contained the blood of the ox, all others remaining clear.

The writers have recently examined some stains upon wood, pieces of plaster, cloth, and glass which were supposed to be human blood. At first it was difficult for them to obtain human blood serum in sufficient quantity, so they resorted to pleuritic fluid. This was injected into rabbits subcutaneously in quantities of 10 cubic centimeters. The blood was drawn on the nineteenth day, too early to get a satisfactory reaction, but a faint reaction was obtained with known human blood. Later four rabbits were injected with human blood directly into the peritoneal cavity at intervals of eight to ten days over a period of two months. The injections were commonly attended with loss of weight, though this was usually regained before another injection was given. Several days after the sixth injection the rabbits were thoroughly anesthetized, the carotids opened, and the blood collected in sterile glass jars. These were placed on ice and the serum removed after twenty-four hours. Chloroform was added to part of the serum, and no preservative to the remaining portion. The blood serum of a rabbit that had no injections was also collected in the same manner.

The blood to be tested, if fluid, was diluted first with tap-water, and then with an equal quantity of double normal salt solution, until it was of a pale pink color. It was then divided into two, three, or four nearly equal parts, placed in small test-tubes, and three drops of the test and control serums added to the several tubes. These were then placed in the incubator at 35° C. and observed at intervals of one and one-half hours. If dried blood were being tested, the spot was soaked in water, and if necessary the solution cleared by filtration. An equal quantity of double normal salt solution was added, and it was then treated the same as the fluid blood. In all cases in which the reaction occurred, and in the specimens known to be human blood, the reaction set in in one-half hour or less, while in other specimens known to be not human blood there was no response to the test at all. In the suspected murder case a positive reaction was obtained in three instances, two from stains on wood and one upon cloth. Some tests gave a negative reaction, but in these cases the stain was very small, and possibly might not have been blood.

The appended tables show the experiments performed by the writers, with their results:

Number.	Blood tested.	Serum added.	Result in 1 hour or less.
1	Fresh dried human.	H. R.*	Heavy flocculent precipitate.
2	" " "	H. R.	5 minutes, faint turbidity.
3	" " "		15 minutes, marked turbidity.
4	Fresh human.	O.†	No change.
5	" "	O.	No change.
6	" "	H. R.	10 min., initial turbidity increased.
7	" "	H. R.	45 min., decided turbidity.
8	" "	O. R.‡	No change.
9	" "	C. H. R.‖	Turbid.
10	" "	H. R.	Turbid.
11	" "	O. R.	No change.
12	" "	O.	No change.
13	" "	C. H. R.	Turbid.
14	" "	H. R.	Turbid.
15	" "	O. R.	No change.
16	" "	O.	No change.
17	" "	H. R.	Turbid.
18	" "	O. R.	No change.
19	" "	H. R.	Turbid.
20	" "	O. R.	No change.
21	Human, on paper.	O.	No change.
22	" "	H. R.	Turbid.
23	Human, on wood.	O.	No change.
24	" "	H. R.	Turbid.
25	Human, on cloth.	O.	No change.
26	" "		

*H. R.—Humanized rabbit. ‡O. R.—Ordinary rabbit. ‖C. H. R.—Humanized rabbit to which chloroform had been added. †O.—Nothing added.

Blood used.	Serum added.			
	Humanized rabbit.	Ordinary rabbit.	Chloroform human. rabbit	Nothing.
Chicken	—	—		
Pigeon.	—	—		
Dog	—	—	—	—
Turkey	—			—
Ox	—	—		—
Sheep	—	—		
Cat	—	—	—	—
Mixed	—			—
Pig	—	—	—	
Rabbit	—			—
Human (Fresh blood, old blood on paper, glass, wood, and cloth)	+	—	+	—

+ = Positive reaction; — = Negative reaction.

BLOOD FROM VARIOUS ARTICLES IN SUSPECTED MURDER CASE.

No.	Taken from.	Serum added.	Result in 1 hour or less.
1	Step 2.	H. R.*	10 minutes, marked turbidity.
2	" 2.	O.†	10 minutes, no change.
3	" 9.	H. R.	No change, very dilute.
4	" 9.	O.	" " " "
5	" 10.	C. H. R.‖	" " " "
6	" 10.	O. R.‡	" " " "
7	Lower step.	H. R.	Turbid.
8	" "	O. R.	No change.
9	Towel.	H. R.	Initial turbidity increased.
10	"	O. R.	" " not increased.
11	Plaster 6.	H. R.	No change, very dilute.
12	" 6.	O. R.	" " " "
13	" 6.	O.	" " " "
14	Step 5.	H. R.	" " " "
15	" 5.	O. R.	" " " "
16	" 5.	O.	" " " "

*H. R.—Humanized rabbit. ‡O. R.—Ordinary rabbit. ‖C. H. R.—Humanized rabbit to which chloroform has been added. †O.—Nothing added.

Fistula Vestibulo-rectalis sub Coitu Primæ Noctis. — SCHEFTEL, G. *Wiener Klin. Rundschau*, 16th year, No. 39, p. 753, Sept. 20, 1902.

A number of writers on forensic medicine doubt the possibility of a rupture of the middle third of the vagina during coitus. A number of cases are reported in which the rectum has been torn, and in two at least death followed from severe hemorrhage. A dangerous tear of the genitals in first coitus is a possibility, but it is certainly rare. Fenomenow and other writers have reported vesicorectal fistula resulting from coitus.

The case reported by the writer is that of a woman 22 years old, who had been married eleven months. The first sexual approach was painful and followed by a severe hemorrhage. Each subsequent coitus was followed by severe pain and bleeding. The husband was a strong, well developed man with a large penis. Manipulations with the finger or a foreign body were denied.

The woman was of medium size and well built. The labia were undeveloped, the clitoris small, 0.5 centimeter. There was an opening in the hymen so small that it could scarcely be seen with the naked eye. At the next succeeding menstruation a second opening was found in the hymen; this led into a narrow vagina. Below this opening a dilated fossa navicularis was found; at the bottom of this opening was a tear in the rectal wall 3 by 2 centimeters. The sphincter was intact. The fistula was caused by the penis being advanced not in the axis of the vagina, but against the lower part of the vestibule; the rectovaginal connective tissue and the wall of the rectum were torn through.

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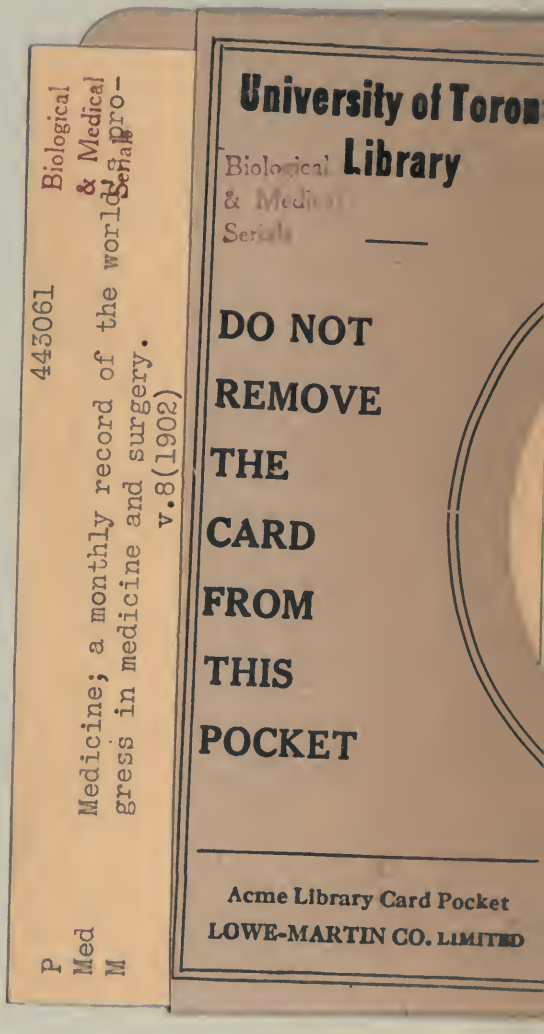
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